40 Rock ©

POPULAR
Computing
WEEKLY

Only 40p.

22-28 November 1984

It's the best selling weekly

Vol 3 No 47

Desk-bound

ICL has now launched its QL technology-based One Per Desk executive workstation.

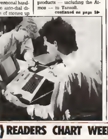
The machine — the first device to incorporate a computer and intelligent telephone terminal in one package — is available in a number of configurations with the base model costing £1195.

One Per Desk (OPD) has been developed from a modified QL and has 128K Ram, 68008 processor, ICL variant of Sinclair SuperBasic, and twin Sinclair Microdrives. It is supplied with either a monochrome or colour monitor. Psion's *Xchange* suite of software is also available as an option (£150) on a plug-in Rom cartridge.

OPD includes a built-in telephone with conventional handset and software auto-dial directory, capable of storing up to 500 names and numbers. An integrated switchable baudrate (300, 600, 1200 or 1200/75) modem provides — with a built-in database directory — single key access to networks such as Prestel, BT Gold and PSS as well as Telex facilities.

An auto-answer capability is linked to a built-in speech synthesiser to provide preprogrammed replies and a message facility automatically records incoming data. OPD also features a built-in calculator and clock.

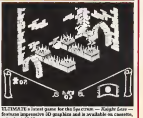
One Per Desk will be available in January.



Oric rights go to Tansoft

HOT on the heels of the announcement by Oric (see *Popular Computing Weekly*, November 15) of three new micros planned for next spring, the company has given sole UK marketing rights of all Oric products — including the Atmos — to Tansoft.

continued on page 5▶



ULTIMATE's latest game for the Spectrum — *Knight Lore* — features impressive 3D graphics and is available on cassette, priced at £9.95.

QL No. 2

SINCLAIR is planning to launch a second QL model in the spring of next year.

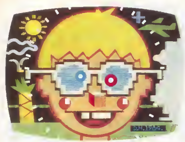
The machine — pitched slightly up-market from the present QL — will differ in that it will have a redesigned circuit board, modified to accommodate Psion's *Xchange* suite of programs — the more sophisticated versions of the present four QL packages — as a built-in extension of the machine's Rom.

Having the packages built in in this way offers a number of advantages. Using the packages is simpler and easier — they no longer need to be loaded from Microdrive and system access to Rom is faster than from Ram. True multitasking is possible and jobs running on any or all of the packages can be run concurrently. The exchange of data between the four packages is quicker. Finally, because the software is provided in five Rom chips (160K in all) the full 128K of Ram is available as work-space.

The Psion *Xchange* Roms in the new QL model will be very similar to those provided in ICL's new One Per Desk project launched last week (see the separate report this page). The Rom versions are faster

continued on page 5▶

INSIDE) READERS CHART WEEK 2) QL LANGUAGES)



PICTURE YOURSELF ON T.V.

We're not the only people who think 'Art Master' and 'Picture Builder' are two quite exceptional computer graphics software programs.

Tony and Rolf do, too. Otherwise they'd never have agreed to put their name to them

commodore
COMPUTER SOFTWARE

With both 'Art Master' and 'Picture Builder' you can create full colour pictures on your own TV screen

And believe us when we say those pictures will match the best computer graphics you have ever seen

Anywhere

The pictures are drawn using either the keyboard or a joystick, and can be stored on either tape or on disk

With 'Picture Builder' you are presented with a palette of 121 colour shades (more than enough for any budding Michaelangelo)

And a collection of character sets totalling over 250 shapes

So you're hardly stumped for choice.

You simply choose your colours and characters, then build up your picture. Just like any other artist

With 'Art Master' you again get a choice of 121 colour shades

But this time you can draw whatever shapes you like, creating your very own high resolution masterpiece from a blank screen

It is even possible to draw circles, and store and then recall a back-up picture – which is more than you can do with other graphics programs

Everyone, from the six year old right up to the 66 year old will enjoy 'Art Master' and 'Picture Builder'

Like all of our software, they have been specifically designed to get the best out of Commodore hardware.

That's why you can't choose better

Commodore software. It costs no more even though there's more to it

ROLF HARRIS
PICTURE
BUILDER
TONY HART
ART MASTER

PICTURE BUILDER ON CASSETTE ART MASTER ON CASSETTE OR DISK. EACH £8.99

Vol 3 No 47

POPULAR
Computing
WEEKLY

)View

Do you ever wonder what happens to the people involved with companies which have crashed spectacularly after they fall from the headlines?

Take Imagine for example. A substantial sum of money — over £1m — was owed by the company when it folded.

Yet since the company went down in July all of its directors and senior employees have now resurfaced.

Imagine managing director Mark Butler is working for Voyager Software. Bruce Everiss — Imagine's operations director — after a spell doing PR work for Yamaha, has decided to accept a job as managing director of Tansoft. Ian MacPherson — Imagine's credit control manager — is now occupying a similar post at distributor Microdealer. John Gibson — one of Imagine's top programmers — has formed a new company — Denton Designs — together with eight other former Imagine programmers working on contract work for Beyond and Ocean.

A bizarre twist is the Sinclair connection. After spending a short vacation in the US, Ian Hetherington — Imagine's financial director — has teamed up with Imagine chairman, Dave Lawson in another new company, Fireiron, to continue work on the Imagine Megagames for Sinclair. They are now on a reportedly hefty retainer from Sinclair being paid to continue the same programming work started before Imagine went down.

Even the Imagine name is to live on — Beau Jolly will continue to sell the company's back catalogue and Ocean will develop new titles to sell under the Imagine label.

In one sense nothing much seems to have changed.

In the future though, things may be a little different for directors involved with such companies. The Government is to introduce in this session of parliament its Insolvency Bill aimed at tightening the regulations regarding company failures.

One of the intentions of the bill is to make directors more accountable in the event of a company's failure and, in particular, to prohibit the holding of directorships by individuals with a history of company insolvencies.

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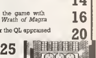

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Astrocrash — next week's star game on the Commodore 64..get rid of the bugs in the QL Rom

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How to submit articles Articles which are submitted for publication should not be more than 2000 words long. The articles, and any accompanying programs, should be original. It is breaking the law of copyright to copy programs out of other magazines and submit them here — so please do not be tempted. **Accuracy** *Popular Computing Weekly* cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work.

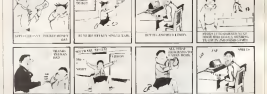
Computer Trade Association Magazine of the Year

WILDEST DREAMS

Software Rental

Just a couple of questions for the computer gamer .....

1. **When did you buy your last computer game?**
2. **How often have you played it?**


THANKS DAD
LITTLE JOHNNY POCKET MONEY DAY
HIGHLY EXPENSIVE GAMES TO BUY
ONLY £9-95
BUYS HIS WEEKLY SINGLE TAPE
BUT ITS ANOTHER LEMON
MAYBE I'LL TRY RENTAL NEXT WEEK
PLUGS IT TO DARREN NEXT DOOR WHO DOES A ROARING TRADE IN 2ND HAND GAMES
THANKS ANYWAY DAD
LITTLE ROGERS SPENDING MONEY IS A BIT LESS
SOFTWARE RENTAL
50p a NIGHT
VIDEOS
BUT HE'S HEARD OF WILDEST DREAMS SOFTWARE RENTAL
ALL THESE PROGRAMS TO CARRY HOME
SO HE GETS LOADS OF PROGRAMS FOR HIS MONEY
ZAP
ZAP
SMILES
AND HAS A BRILL TIME

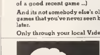
Buying software can seem a pretty bad deal when you pay £5.99 for only a couple of hours play

Well, now you can visit the Circus, help King Clive in his dungeon, beat the computer on your Lazer Byke, explore deep space, eat your way through a cheese warehouse and get totally infuriated by the Mazeball, all for less than the price of one new cassette

How? well, if you go down to your Video dealer today, you're in for a big surprise. He can hire you a Wildest Dream rental cassette for your Spectrum or Commodore 64, featuring one of these games, at a very reasonable price (say about one tenth the price of a good recent game ...)

And its not somebody else's old stock were trying to hire you. These are all brand new games that you've never seen before in the shops - and you won't see them in the shops later.

Only through your local Video dealer can you hire Wildest Dreams rental software



CONTACT:- Chris Kilburn
WILDEST DREAMS
P.O. BOX 84,
COVENTRY.
Tel: (0203) 663085

Tansoft

◀continued from page 1

Bruce Everiss, ex-Operations Manager of the failed Liverpool-based software company Imagine, has been selected as managing director of the new look Tansoft.

"I've always felt that the Atmos was let down by lack of marketing," he commented. "At £150 with a proper keyboard it knocks the socks off the Electron." His appointment as Tansoft managing director follows a recent shake-up at Tansoft which saw the departure of his former chief Paul Kaufmann, and the appointment of Oric managing director Barry Muncaster as Tansoft chairman

Moderate turnout at ZX fair

THIS year's Christmas ZX Fair, held last weekend at Alexandra Pavilion attracted moderate crowds but few exhibitors

By the second day of the show Sinclair was offering a free ZX81 with every QL bought and by the end was knocking £20 off the QL's £399 price

In contrast — rather surprisingly — the 6809 Show for Dragon and Tandy owners, held over the same weekend, attracted large crowds.

New Acorn products at Compec

ACORN has announced a number of new products for its BBC and Electron machine's at this year's Compec Show, held last week.

The Plus 3 add-on for the Electron gives the micro a neat 3½inch single-sided disc drive and interface package providing 300K of storage. The Plus 3 is available now, price £229. An RS432 communications interface for the Electron is also planned.

For the BBC micro, Acorn launched its Music 500 music synthesiser and optional add-on music keyboard. The synthesiser itself costs £199. Two languages were on show — ISO Pascal, available now, and Logo available in December. Both are priced at £59.

On the business side Acorn launched a Winchester hard disc unit for the BBC costing £1 499 for a 10M system and £2 299 for a 30M sustem — both available now. Its long awaited 32016 32-bit second processor option was also shown. Bundled with five languages — BBC Basic C, Fortran 77 Lisp and Pascal — the whole package costs £899 and will be available in early 1985

Acorn's Plus 3 add-on

Second QL

◀continued from page 1

and more compact (in memory terms) than the disc based *Xchange* suites for the IBM PC, Apricot and others because, instead of being written in C the packages have been hand coded in machine code

The up-market version of the QL is expected to sell for around £500 and Sinclair apparently intends to market it in parallel with the present £399 model.

As for export, it seems likely that Sinclair will concentrate its efforts on the new QL model

Sinclair may well launch the more expensive QL model in the US in the New Year, in preference to the present version

Going, going... still going

THE last remaining assets of Imagine, the failed Liverpool software house, are to be sold off by public tender in December

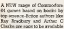
The equipment, including 15 Sage microcomputers 20 portable colour TVs, executive desks, armchairs and typists' chairs will be on view on December 10 and 11.

Details from the auctioneer's offices, Turner and Son, 28-38 Roscoe Street, Liverpool L1 (051 709 4005)

Adventures for CBM 64

A NEW range of Commodore 64 games based on books by top science-fiction authors like Ray Bradbury and Arthur C Clarke are soon to be available in this country.

The programs have been written by the American software house Trillium which specialises in sophisticated adventure games — so-called interactive fiction — based on science-fiction book titles



The titles include software based on *Rendezvous with Rama* by Arthur C Clarke, *Fahrenheit 451* by Ray Bradbury, *Dragonword* by Preiss and Reaves, *Amazon* by Michael Crichton and *Shadowkeep* by Alan Dean Foster

All are disc based C64 titles — because of the amount of text and graphics involved — and will retail for £19 95

The titles are to be distributed in the UK by WHS Distribution, a subsidiary of W H Smith, and will be available from the end of this month.

Atari price cut in US

ATARI Corporation in the US has announced its intention to further reduce the cost of its 800XL computer by almost a third, from $179 to $120 (about £100)

The price drop has led to speculation that the UK price of £169 99 might also soon be reduced. Commented Atari Corporation UK's managing director Simon Westbrook, "There are no plans at present to reduce the price but I could not rule it out in the future."

Slow start for retailers

MAJOR retail chains, both in the UK and in the US are experiencing a slow start to Christmas hardware sales

In the US sales of the Commodore 64 are apparently down between 10 and 30% from last year's figures

The Commodore 64 accounts for more than 60% of all under $500 micros in the States. Its only competitors are the Atari 800XL, which has only shown a slight sales rise after a price cut down to $179, and Coleco's Adam, for which sales have been disappointing

Although in Britain the marketplace is more competitive, with a greater variety of machines, it seems that here too, sales are not much up on last year. Peter Frost of Boots computer buying department, said "It is still anyone's guess whether the market will develop as it did last year. I don't think our sales this Christmas will be worse than last year but they may not be better."

Dave Bryant, sales manager for home computers at Spectrum group, commented "The trend has certainly slowed down so far this year, but with TV advertising from a number of companies including Commodore, I think there will be a big surge in December." At W H Smith, George Bradbury added. "The market is taking a while to get going, but it's okay now."

All three commented that the C16 and the Spectrum+ are currently selling well.

Views on MSX machines now reaching the shops were mixed. "It looks as though MSX micros will be few and far between this Christmas," said Dave Bryant. "The Toshiba is selling, but, frankly, not very well," added Peter Frost.

SHARDS SOFTWARE PRESENTS . . .

for SPECTRUM 48k

GALILEE

The long awaited sequel to
JERICHO ROAD

Galilee *is an extensive text adventure with graphics. As the story unfolds you will become entangled in the drama that surrounded the early days of the Christian era*

Written by Peter Goodlad – Author of ***JERICHO ROAD***

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SHARDS . . . WORLDS APART

BEEEEOW
BUDDA
BUDDA
WE CAN'T OUTRUN 'EM! AN' THERE'S TOO MANY OF 'EM!
WE'RE TRAPPED!
AAA AAA
VIP VIP VIP THING

Played on 7 full Graphic World Maps

EMPIRE

THWART THE PLANS OF THE EVIL EMPIRE AS IT ATTEMPTS TO CONQUER THE WORLD.

£6.95

CBM 64

"An extremely good game – highly recommended" Personal Computer News

"This is a terrific game – visually attractive and highly addictive" Home Computing Weekly

Boots Selected Stores

AVAILABLE NOW AT ALL GOOD STOCKISTS or by MAIL ORDER (send cheque/PO) from **SHARDS SOFTWARE** Roycraft House, Linton Road, Barking, Essex.
OR Telephone through your Access/Visa order to 01-594 7666

Letters

Cry from a Commodore

I own a CBM 64, and on my own behalf and that of my fellow 64 users, I would like to ask if Ultimate are bringing their Spectrum classics out for our machine?

N Brailsford
Chesterfield
Derbyshire

No idea — Ultimate never tell anyone anything.

Watered down Rocky

I read with interest the News Desk item regarding CRL's intended computer game version of 'The Rocky Horror Show' (PCW 8-14 Nov) and felt moved to make the following observations

Clement Chambers CRL's MD stated that he intended his game to derive its appeal from the show's strange environments and to avoid what he describes as 'the elements of dubious taste in the show

Come on Mr Chambers Without wishing to seem in any way rude, you must have had your head in the sand these last few years! The show has enjoyed a cult following for precisely these 'dubious' reasons

The central character in the show is undoubtedly *Frank n Furter*, the corset wearing, whip toting Mad Scientist so ably portrayed in the original show (and movie) by Tim Curry And of course the one song from the show to become an enduring favourite and to stay in most people's minds is 'Sweet Transvestite (from Transexual Transylvania)'

Remove these elements and you might as well just produce yet another cloned-to-indifference platform game!

Please, Mr Chambers, don't let Rocky Horror fans down. Don't remove the teeth from the beast! Rocky was suggestive yes, but never, never offensive It was (and is) a radical entertainment, and it would be a mistake of the first order to use it's name on a product which was not true to the spirit of the original!

Having got that off my chest, I would just like to thank PCW for it's Amstrad Page its good to see a popular computing magazine devote so much space to this wonderful machine Keep up the good work!

Rob Baxter
50 Milton Grove
Whalley Range
Manchester

Copy comment

With respect to the Ziggurat article by Tony Kendle about applying CP/M to the home computer market, it is worth pointing out that with CP/M it is fairly easy to copy programs, using PIP

If home micro users have no qualms about copying a £8 game, many of which are highly protected, how will they feel about a £300 word-processor?

Andrew Simmons
Demon Software
3 High Street
Drybrook
Glos

Scribble update

The *Scribble* program for the Amstrad written by Brian and David Lewis in the October 25 issue is good but the cursor can occassionally disappear

If Lines 110 to 140 and Line 370 are amended as shown it will solve the problem

```
[illegible]
```

Ian Duerden
44 Kelswick Drive
Nelson
Lancs

Quill continued

With reference to Chris Davis's letter in the October 26 issue about alternative ways of editing QL programs using *Quill*

Before I wrote the utility for the magazine, I also thought of the method he suggested but it involves alteration of the printer driver first, which is a cumbersome task, and also it does not work on all versions of *Quill* (fact!)

This means that before writing letters/documents using *Quill*, a new printer driver must be installed using *install bas*

Installing a printer driver is like waiting for a No 9 bus

When I wrote the utility, which works with all versions of *Quill* to date I first used *Input #chan* to access the file, which was very fast, but if a line was encountered which was more than about 120 characters, a buffer error exception occurred. So I had to make use of *Inkey$ (#chan, –1)* Rumours now abound that Psion might add the facility to save Loadable Basic programs from *Quill* in the future, but I think its main priority should be to cut out the overlays, speed it up, and make it more secure

By the way, if anyone is interested in a Sprite *Designer* or an Assembly Language Tutor for the QL they can write to me c/o *Popular* for details.

Richard Snowdon
Co Durham

"Unfortunately, it wasn't the computer auditors who discovered the irregularity in the accounts — it was a hacker"

No more jobs

In your recent edition (October 25) Graham Taylor's *Street Life* article covers the Central London Youth Project's Micro Training Programme

We would like to point out that the article has misquoted myself by implying that firms such as Esso IBM and the GLC will offer jobs to young people on our course at the end of the year This is not the case — Esso, IBM and the GLC have offered five week work experience places to our young people during their year's training which is separate from the question of jobs at the end of the year

Dawn Charles
General Studies Tutor
Central London Youth Project
99-103 Long Acre
London WC2

Win a ZX Spectrum+

Just in case you missed last week's issue we are offering a chance to win a brand new ZX Spectrum+, complete with its six bundled software packs — worth £179.95

All you have to do is correctly identify the eight software programs which appear in Sinclair's current TV advert for the Spectrum+

Fill in the form below with the eight titles and send it off to 'Sinclair Competition, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD to reach us no later than midday on Friday, December 7

There is also a tie break in case more than one entrant gets the eight program names correct Read the idea for a new Sinclair game and think up a good title for it: As an heir to a vast fortune you have to find and piece together the fragments of a portrait distributed around an isolated mansion **The judges decision is final.**

Name ....
Address ....

Fortune game title ....

1	2	3	4
5	6	7	8

Hardware Review

First-rate

Hardware *Ferguson TX Portable Colour Monitor Television* **Price** £229.95 **Supplier** Thorn EMI Ferguson, Cambridge House, Great Cambridge Road, Enfield, Middx

After peering closely at my TV screen for some time to read the script on *Tasword* or having to bring home a heavy monitor to use the school BBC B at home I decided to give the new Ferguson TX with RGB a trial.

Before using the Spectrum with the set I needed to fit a video output adapter then make up a suitable lead. Adapt Electronics sell a suitable adapter with clear instructions

Ten minutes to solder up a lead between phono and a 240 degree din plug (the connections are shown on the back of the TV), switch on and plug in with fingers crossed.

Voila! With a click the screen lights up with a clear image and no background noise (the volume may be left set for TV usage, sound is muted automatically) Trying *Border*, *Paper* and *Ink* on various settings revealed that the colours were clear and bright The image is generally much sharper than normal.

I tried the new monitor out on a few games *Jetset Willy* jumps and marches through the sparkling halls of his mansion with a crispness not seen before On to *Valhalla* and after a little fiddle with the variable capacitors C1,C2 the small figures are sharp and steady and bottles and rings are recognisable The only fault being green, blue and yellow which when mixed as in the trees still scintillate well we can't have everything I shall be reluctant to take this set back to the shop

Using *Tasword* with a blue paper, white text and magenta border to define the right hand margin clearly, I found I could read text from two yards away

Trying it now with the BBC, the composite video output only provides a grey scale picture although admittedly with good resolution and a small border. So back to the bench and make up a RGB lead — a little more tricky this one and Ferguson do list one as an optional extra. Life would be easier if one had been in stock.

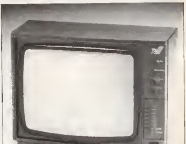
However, plug everything in and try ★W , up comes *Wordwise* nice and clear The top line of Editing mode was half out of sight so escape to menu and type ★TV255 to lower the display, it was much improved. *Load* a text file the acid test being what a page of text looks like in preview 80 column mode *Mode* 0/3 The result was most pleasing, a clearer image than the standard issue M. V monitor at school. The resolution must be good.

I next tried a graphics program that draws in *Mode* 0 A large circle has a slight distortion towards the top but that's being nit-picking Lines are finely drawn. Only the brightness control on the TV affects the screen image colour and contrast have no effect unlike when using the composite video input from the Spectrum In fact after chaining through a few programs from disc the colours and screen display, as might be expected from RGB input, cannot be faulted.

Leaving both computers running, the only adjustment needed when switching between RGB and video is to turn the brightness down for RGB and up for video or TV

In conclusion the Ferguson TX RGB a first rate performance and will not be going back to the shop tomorrow Anyone want to buy a two year old 14inch colour portable?

David Cole



Essential item

Hardware *Spectrum Video Adapter* **Price** £3.45 **Supplier** Adapt Electronics, 20 Starling Close, Buckhurst Hill, Essex

This small item is an essential for any person wishing to connect their ZX Spectrum to a monitor that requires a composite video signal.

The adapter arrives in a small poly bag with an A4 sheet of instructions and two small pieces of insulation tape (1cm square).

It consists of a short length of wire with a Phono socket at one end and two clips attached to red and yellow wires at the other It is neatly finished.

The step by step fitting instructions are clear and rightly stress the need to take care when opening up your Spectrum to make the necessary connections No soldering is required. Diagrams are included for issue 2 and issue 3 Spectrums. Fitting takes less than five minutes if you include looking for your screwdriver The new socket is left hanging out of the back of the Spectrum case next to the EAR socket A little untidy I was able to improve the fitting with more space available in my Fuller Keyboard case

If the monitor has a TV type socket than you may connect up with the standard Spectrum lead, but connecting to the monitor will require another lead for the composite video input These are available from Adapt Electronics (£3.50 — £4.00)

We first tried the adapter with a BBC 12 inch green screen monitor *Tasword's 64* character screen could be zoomed to fill the monitor screen and the clarity was improved by *Pokeing* the *Paper* and *Ink* colours to black and white respectively (instructions to do this are available from *Tasword*). The resulting display was professional, and after two hours of letter writing and file manipulating with masterfile, eye strain was definitely reduced. A useful purchase

David Cole

Ingenious...

Leisure Genius presents
COMPUTER
SCRABBLE
For the Commodore 64
'more fun from your micro'
Waddingtons
COMPUTER
CLUEDO
The Great Detective Game
For the Commodore 64
'more fun from your micro'
Leisure Genius
COMPUTER
Kensington
For the Commodore 64
'more fun from your micro'
Leisure Genius
COMPUTER
MASTERMIND
For the Commodore 64
'more fun from your micro'

Computer games for people who hate computer games.

Give your joystick a rest, and your brain a chance with these family favourites.

Software by...

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NOW AVAILABLE AT Boots WHSMITH AND AT OTHER LEADING STORES.

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Porter

It was never like this at the Hilton in Porter on the Spectrum 48K by Stephen Fisk

Few two-player games in which both players are active at the same time have been designed for the Spectrum (with one or two notable exceptions), despite their advantage of generating greater variety. In any game played against the computer the strategy of the machine, however complex, is of course predetermined and will gradually be learnt by the player. Against human opposition, on the other hand, a player will meet a wide range of different strategies. Different opponents will tend to play in, say, an aggressive or defensive fashion, and even a single opponent can be expected to use different strategies at different times.

In *Porter* each player controls a porter who can attempt to shoot the other porter and also has the task of carrying suitcases from one side of the screen to the other. The suitcases for the blue porter start on the left and have to be carried across to the right; and vice versa for the red porter. In order to pick up a suitcase the porter must be located directly above it.

Each player in the game has three lives, and the game ends when one player has lost all three lives. The winner is the player with the highest score at that moment.

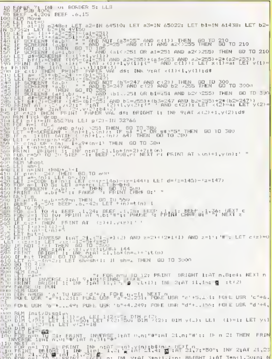
You shoot in the direction in which you are facing and shots have a limited range. If you hit a porter who is carrying a suitcase, the suitcase as well as the porter will disappear. For this reason, if you expect to be shot it is often wise to drop any suitcase immediately; it will at least be possible for the succeeding porter to retrieve it.

Hitting the opponent scores three points, shooting, but missing is minus one point. Dropping a suitcase after carrying it across the screen scores the number of points displayed on the suitcase.

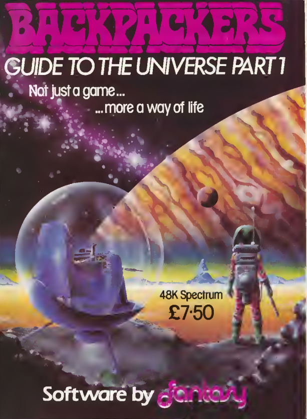
The controls are as follows:

	Blue	Red
Up	3	8
Down	S	J
Right	E	I
Left	W	U
Pick up	Z	Symbol shift
Drop	X	M
Fire	C	N

TAKE THAT, LOW LIFE !!
DID ANYBODY EVER TELL YOU, YOU LOOK LIKE A TEAPOT



```
10 PAPER 7: INK 0: BORDER 5: CLS
20 GO SUB 4000
90 BEEP .4,20: BEEP .6,15
100 REM Move
102 LET hit=0
105 LET a1=IN 63486: LET a2=IN 64510: LET a3=IN 65022: LET b1=IN 61438: LET b2=
IN 57342: LET b3=IN 49150
110 LET a=x(1)+(a3=253)-(a1=251)
115 LET b=y(1)+(a2=251)-(a2=253)
140 IF SCREEN$ (a,b)<>" " AND NOT (a3=253 AND c(1)) THEN GO TO 210
142 IF SCREEN$ (a,b)<>" " AND a3=253 AND c(1) AND a2<>255 THEN GO TO 210
145 IF NOT c(1) THEN GO TO 185
150 IF SCREEN$ (a+1,b)<>" " AND (a1<>251 OR a1=251 AND a2<>255) THEN GO TO 210
160 LET d$=SCREEN$ (x(1)+1,y(1))
185 LET b$(1)=CHR$ (145-(a1=251 AND a2=255)+(a3=253 AND a2=255)+2*(a2=253))
190 PRINT AT x(1),y(1);" ";AT x(1)+1,y(1);(" " AND c(1)): LET x(1)=a: LET y(1)=
b: PRINT INK 1;AT x(1),y(1);b$(1)
200 IF c(1) THEN PRINT PAPER VAL d$; INK 9;AT x(1)+1,y(1);d$
210 LET a=x(2)+(b3=247)-(b1=251)
215 LET b=y(2)+(b2=251)-(b2=247)
240 IF SCREEN$ (a,b)<>" " AND NOT (b3=247 AND c(2)) THEN GO TO 300
242 IF SCREEN$ (a,b)<>" " AND b3=247 AND c(2) AND b2<>255 THEN GO TO 300
245 IF NOT c(2) THEN GO TO 285
250 IF SCREEN$ (a+1,b)<>" " AND (b1<>251 OR b1=251 AND b2<>255) THEN GO TO 300
260 LET d$=SCREEN$ (x(2)+1,y(2))
285 LET b$(2)=CHR$ (145-(b1=251 AND b2=255)+(b3=247 AND b2=255)+2*(b2=247))
290 PRINT AT x(2),y(2);" ";AT x(2)+1,y(2);(" " AND c(2)): LET x(2)=a: LET y(2)=
b: PRINT INK 2;AT x(2),y(2);b$(2)
295 IF c(2) THEN PRINT PAPER VAL d$; BRIGHT 1; INK 9;AT x(2)+1,y(2);d$
300 REM Pick drop
310 LET p(1)=IN 65278: LET p(2)=IN 32766
315 FOR n=1 TO 2
320 IF p(n)<>253 AND p(n)<>251 THEN GO TO 380
330 LET s$=SCREEN$ (x(n)+1,y(n)): IF s$<"1" OR s$>"5" THEN GO TO 380
335 IF n<>1+INT (ATTR (x(n)+1,y(n))/64) THEN GO TO 380
340 LET c(n)=(p(n)=253)
350 IF c(n) OR y(n)<>1+29*(n=1) THEN GO TO 380
355 LET t(n)=t(n)+VAL s$
360 PRINT BRIGHT 1; INK n;AT 21,16*(n=2)+7;t(n)
370 FOR r=50 TO 30 STEP -1: BEEP .008,r: NEXT r: PRINT AT x(n)+1,y(n);" "
380 NEXT n
400 REM Shoot
405 LET sh=1
408 LET n=INT (RND*2)+1
410 IF p(n)<>247 THEN GO TO 600
415 LET a=x(n): LET b=y(n)
420 LET z=CODE b$(n): LET c=(z=146)-(z=144): LET d=(z=145)-(z=147)
430 FOR m=1 TO 5: LET a=a+c: LET b=b+d
440 IF SCREEN$ (a,b)<>" " THEN GO TO 500
450 PRINT AT a,b;"*";: PAUSE 7: PRINT CHR$ 8;" "
460 NEXT m
500 IF ATTR (a,b)=59-n THEN GO TO 550
510 BEEP .4,-30: BEEP .6,-42: LET t(n)=t(n)-1
540 GO TO 590
550 FOR c=1 TO 4: BEEP .1,24: BEEP .1,28: BEEP .1,31: BEEP .1,36: NEXT c
555 FOR z=1 TO 10: PRINT AT a,b;"*";: PAUSE 5: PRINT CHR$ 8;" ": NEXT z
560 LET z=1+(n=1)
565 IF c(z) THEN PRINT AT x(z)+1,y(z);" "
570 LET l(z)=l(z)-1
572 LET t(n)=t(n)+5
573 LET hit=1
575 PRINT INVERSE 1;AT 21,(27+l(2) AND z=2)+(2+l(1) AND z=1);"*": LET c(z)=0
: LET x(z)=1: LET y(z)=13+5*(z=2)
580 IF NOT l(z) THEN GO TO 3500
585 PRINT INK z;AT x(z),y(z);CHR$ 144
590 PRINT BRIGHT 1; INK n;AT 21,16*(n=2)+7;t(n)
600 IF hit THEN GO TO 3000
610 LET n=2-(n=2): LET sh=sh+1: IF sh=2 THEN GO TO 3000
620 GO TO 410
3000 GO TO 100
3500 REM End
3510 LET e$="               ": FOR n=8 TO 12: PRINT BRIGHT 1;AT n,8;e$: NEXT n
3520 PRINT INVERSE 1;AT 9,10;"FINAL SCORE"
3530 PRINT BRIGHT 1; INK 1;AT 11,10;"■";t(1): INK 2;AT 11,18;"■";t(2)
3999 PAUSE 0: RUN
4000 REM UDG
4010 FOR n=USR "a" TO USR "d"+7: POKE n,-1: NEXT n
4020 POKE USR "a"+1,231: POKE USR "a"+2,231: POKE USR "c"+5,231: POKE USR "c"+6,
231
4030 POKE USR "b"+3,249: POKE USR "b"+4,249: POKE USR "d"+3,159: POKE USR "d"+4,
159
5000 REM Init/Display
5010 DIM l(2): LET l(1)=2: LET l(2)=2: DIM c(2)
5020 DIM t(2): LET t(1)=50: LET t(2)=50: DIM x(2): DIM y(2): LET x(1)=1: LET y(1
)=13: LET x(2)=1: LET y(2)=18
5030 DIM p(2)
5040 LET b$="■■"
5100 FOR n=0 TO 21: PRINT INVERSE 1;AT 0,n;"#";AT 21,n;"#";: IF n<21 THEN PRIN
T INVERSE 1;AT n,0;"#";AT n,31;"#"
5110 NEXT n
5200 FOR n=1 TO 2: PRINT INK n;AT x(n),y(n);b$(n): NEXT n
5210 PRINT BRIGHT 1; INK 1;AT 21,2;"■";AT 21,4;"■";AT 21,7;"50"; INK 2;AT 21,23
;"50";AT 21,27;"■";AT 21,29;"■"
5220 FOR n=1 TO 5: PRINT PAPER n; INK 9;AT 3*n+1,1;n; BRIGHT 1;AT 3*n+1,30;n: N
EXT n
5999 RETURN
```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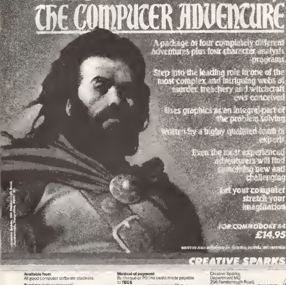

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Voices in the wilderness

***Christina Erskine** walks in The Jungle and tramples through MUD . . . all without getting her feet wet*

Alan Carmichael head of Compunet Teleservices, reckons Compunet is one of the first truly interactive databases.

What he means by this is that on Compunet there is plenty of scope for talking to other Compunet users, whether through the user's software 'market', The Jungle, or playing Multi User Dungeon with up to 100 others

I went to talk to Alan, and Graham Craigie, general manager of Compunet Teleservices, at the company's newly acquired premises in the centre of London.

Compunet was originally set up as a joint venture between Commodore and ADP Network Services, to provide a network database specifically for Commodore 64 owners Both Alan and Graham were formerly at ADP, and involved with Compunet's development from the very beginning

"ADP decided on a major strategy review earlier this year, saying it would only continue investment in three areas — and Compunet wasn't one of them!" explained Alan. "Graham and myself left the company to form Reactive Technology and carry on the commitment to develop the system.

"While ADP still supplies the network itself which Compunet runs on, it is no longer involved in ownership Compunet is now a separate company owned jointly by Commodore and Reactive Technology"

The interaction between users particularly convinced Alan and Graham that Compunet was viable 'We felt and still do feel, that people don't just want to retrieve information from the big databases We wanted 64 owners to be able to participate more. They should be largely deciding what goes into it.

Hence The Jungle, a section of Compunet, where, says Alan, "users are pretty much allowed to do what they want The Jungle gives members the facility to up- or down load software, insert small ads — the most interesting small ad I saw was a QL for sale — leave messages — as on a bulletin board — and write comments complimentary or otherwise, about software on offer from other Jungle users. While on other sections of the network a fixed price is charged by Compunet for taking advantage of the facilities in the Jungle, software providers can charge their own price for their efforts.

"Obviously, with something uncontrolled like this, some people may abuse the system and users are free to make complaints If we come across anything really dreadful like piracy or obscenity, then we can cut off someone's account."

Compunet is designed to be as inexpensive as possible for the user The first year's subscription is free and membership arrives automatically with the purchase of the Commodore Communications Modem at £99.95 "What has actually happened is that Commodore is paying us the £30 for each person which is the yearly subscription. Calling up Compunet during off peak phone times — after 6pm and all weekend — is also free, apart from the British Telecom phone charge of course. Users will only have to start paying Compunet when using the facilities — there is no charge for just flicking through the pages and seeing what's on offer"

Subscribers to Compunet have an account opened for them Every time they "buy" anything the cost is automatically recorded and the subscriber is billed accordingly

The *Edit* facility, which comes as part of the modem software enables pages to be compiled while off-line, before being input into Compunet on-line, this saves money and it also allows the user to store pages on-line, and then browse through them at leisure later, off-line

Using Compunet has been made as easy as possible too with a 'duck shoot' style menu permanently travelling along the bottom of the screen, containing all the necessary commands "Up-load" "down load" "buy" and so on

How many Commodore owners are going to get deeply involved in using Compunet? Neither Prestel nor Micronet have attracted as many subscribers as originally hoped (Micronet has only around 15 000 subscribers)

"I think networking is set for a big boost in the next year" said Alan "We do feel it is going to appeal to a fairly small regular user base, but with the modems themselves, a price barrier has now been broken. Three months or so ago modems were costing £160 to £170 Ours at just under £100 comes with all the software necessary to plug in and get going straightaway

"Initially, we think Compunet will appeal to the keen enthusiasts, the buffs and hackers That will account for our first 5-6000 users But after that as it develops, we want the network to provide interest to the whole family"

At the moment, Compunet is still in the process of developing and finalising many of the services available Currently up and running is Commodore's own Vicsoft library of education programs in the section entitled *The Study* — most of which are free to down-load.

"There are about 60 different programs available at the moment covering subjects from Maths to Health Education," said Alan. "We're planning to add about ten new titles each month to the list The library of educational programs is a prized possession of Commodore's — it was put together in Canada in the days when the Pet was the leading education machine, and a lot of the programs have since been converted for the 64"

A more controlled — and controllable — version of The Jungle, Software Park, is administered by Compunet. This section comprises commercial programs, which cost money for the user to down load. Mr Micro is just one of the companies which has sent programs to Compunet to be sold in this way

Most of the programs in Software Park are protected, in that the user's modem number is encoded into the program when it down-loads.

Then there is Compucat, Compunet's resident journalist, keeping all users abreast of events in a highly personal, chatty style,

Also on the go is MUD, the Multi User Dungeon — at present the showpiece of Compunet. This Dungeons and Dragons style adventure was set up and developed largely by Richard Bartle for students at Essex University. Its implementation on Compunet is the first time a true multi-user adventure has been easily available to the public "It seems to be taking off quite well, too," said Graham. "I logged in about three days after it was first available and already there were six others in the game"

"There's lots more to come on the system," said Alan. "The home banking service will be announced this month — this

Ian Carmichael (right) and Graham Cragie of Compunet Teleservices

will be very much consumer orientated, with advice on how to get loans, what sort of insurance people need and so on.

"The idea is to introduce something new each month. For instance, next month a computer magazine — no I can't tell you which one — is going to become available on Compunet as well as appearing conventionally in print."

The estate agency service, vaunted in Compunet's pre-publicity releases is on Compunet, but not yet available to public users, though it will be within the next few months.

"National Property Link do a computer networking service for estate agents and offered to do this via Compunet. At the moment it is marketing direct to the agents but it will be thrown open to the public in the not-too-distant future."

Also tucked away in a corner of Compunet is an interesting page, which gives explicit instructions for accessing Prestel through the Commodore modem.

Isn't this a somewhat self-defeating exercise? "Not at all. If people want to access Prestel, then they're going to find out how to access Prestel, whether we tell them how or not. Several Compunet users have accounts with both networks anyway so I don't see that we should see them as rivals. Compunet's better."

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Me? Who?

Program *Know Your Own Personality* **Micro** Spectrum 48K **Price** £9.95 **Supplier** Mirrorsoft Holborn Circus, London EC1

Dear Clare — Nobody likes me. Even my Spectrum crashes when I approach. What should I do? — Worried.

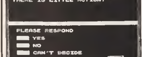
Dear Worried — Could it be that you have a personality problem? In this case I have a computer program based on a best selling paperback by Professor Hans Eysenk and Dr Glenn Wilson to help you 'know yourself'.

It asks you multiple choice questions about your views and behaviour — 630 to be exact, divided into three groups, so it all takes time and there's lots of data reading. Then, in less time than it takes to spell psychoanalysis, it produces a bar chart and written comments that define your characteristics.

But, Worried, you ask me if this is scientifically sound. The accompanying booklet makes certain cutal high sounding claims, but lest you worry too much when you find it says that you should be locked away I would suggest that there are too many variables involved.

An unusual addition to any self seeking Habitat household — but when you really need help the micro will never replace us agony aunts.

John Minson



DO YOU BECOME RESTLESS WHEN WORKING AT SOMETHING IN WHICH THERE IS LITTLE ACTION?

PLEASE RESPOND

YES

NO

CAN'T DECIDE

Also ran

Program *Sports Hero* **Micro** Spectrum 48K **Price** £6.95 **Supplier** Melbourne House, Castleyard House, Castleyard, Richmond Surrey

Somebody ought to tell Melbourne House that the Olympics have finished — *Sports Hero* is so obviously a game released a few months late. If you've played *Athlete*, then you will find little new in *Sports Hero*. There are good animated graphics and smooth running action as you attempt to qualify for the finals of the four events: 100 metre sprint, 110 metre hurdles, long jump and pole vault. Unfortunately the finals never happened, so the best you can do is qualify. The blurb on the cassette box is all too honest: 'Here's your chance to be part of a winning team.'

As in *Track & Field*, you achieve speed by pressing two keys in quick succession: the faster you press, the quicker the athlete runs.

The hurdles and pole vault are quite difficult — it's hard to judge when to make the jump to clear the hurdles and the pole is easy to break, with dire consequences, when vaulting. There are three levels of difficulty, each with its own detailed background graphics.

Different, and certainly appealing to armchair athletes but I don't think the AAA will be too worried just yet.

Simon Springett

Pot shot

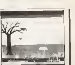
Program *Potty Pigeon* **Micro** Spectrum 48K **Price** £5.95 **Supplier** Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield

What are pigeons best known for? That's right — gathering worms to feed their young. That's your mission as Percy, the *Potty Pigeon*.

Your air space is as crowded as fog-bound Heathrow though, and the worms appear in the most inconvenient places, such as roads, so it's easy to become a late pigeon.

Now what else are pigeons known for? Laying eggs ... at least I think they're eggs! Whatever, they serve as bombs to dispose of your opponents.

So long as you remember to rest your wings regularly you are ready to fly the world's first pigeon flight simulator.



Like many multi-screen games this requires careful timing and hot reactions. Perhaps less strategy than usual is called for, but at least Gremlin have disposed of the platform element that is so common nowadays. In fact, *Potty Pigeon* is a joy graphically, humorously and is smoothly animated and highly detailed.

Sad to report than that the keyboard control is not good, owing to an odd selection of keys and a joystick is necessary. I also wonder about its lasting addictiveness — it lacks the puzzles of arcade adventures.

John Minson

Take two

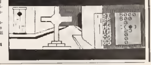
Program *Wrath of Magra* **Micro** Spectrum 48K **Price** £12.50 **Supplier** Mastervision, Park Lorne, 111 Park Road, London NW8

Wrath of Magra is the third of the Third Continent series of games originally released by Carnell Software, and now put out in an improved, speeded-up form by Mastertronic under the Mastervision label.

The price may seem steep but it's well worth it — you get three games, detailed instructions and a 158 page tome *The Book of Shadows*, which gives you the history behind the adventure game's plot, and includes a list of spells you can use, and monsters you may meet.

The objective of the game is to rescue the Elfin Princess Edora, and kill the evil witch Magra.

The first episode is set in a village, and is text and graphics. The screen display includes a picture of each location, a status display indicating your strength, both physical and spiritual, your combat ability, the time, the phase of the moon (important in spell casting) and so on. The lower part of the screen is used for text instructions and command entry. This episode follows fairly standard adventure format, with a few deviations. Items present in a location will only be listed a command — and even then some things which can be got will not be there. You have to guess where certain things can be found and



proceed on the assumption that you are right In the wood for example, you will not be told that deadly nightshade is growing but you can still pick it up

Most of the items collected in Episode 1 are spell components which you need in Episodes 2 and 3

These latter two sections are presented in a slightly different format from Episode 1, instead of a graphic depiction of your present location, you see a map of the maze of caves or castle rooms you are moving through The screen display is otherwise the same

Magra can be a little slow and the repetition of 'I don't understand gets very wearing but — these minor complaints aside — it is a very challenging package

Mastertronic should be thanked by all adventure fans for rescuing it from the wreck of Carnell Software They also rescued Stuart Galloway and Roy Carnell, who created the Third Continent series and we should be seeing some interesting packages coming from Mastervision over the next few months

Martin Croft

★★★★★

Bust-up

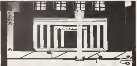
Program *Ghostbusters* **Micro** Commodore 64 **Price** £10 99 **Supplier** Activision, 15 Harley House, Marylebone Road, Regents Park, London NW1

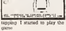
In general, spin-offs tend to be rather second rate products riding on the back of some other success

So, it was with great trepidation that I loaded *Ghostbusters*, thinking back to the very funny movie I saw earlier this month.

The film itself (not yet released in this country) is amazing — so why have Activision launched the game now, instead of waiting for the buzz that the film is certain to cause?

Somewhere in the distance coincidentally some radio began to play the *Ghostbusters* ho theme Catchy little tune I did a double take the sound was coming from my Commodore! Synchronized with the music, the words were being displayed, together with a little bouncing white ball to tell me what to sing. I was invited to press the space bar "Ghostbusters!" it grinned Wow! Feet





tapping I started to play the game

It is a 10% business, 10% strategy, 80% arcade game In a starting sequence you are given $10 000 with which you buy your ghostbusting equipment Then the fun starts There are three main sequences. The city map display shows you where there is a psychic disturbance, and you trace a path there from your current position. You are then shown — in plan view — on a three-lane highway en route which gives you an opportunity to catch roaming ghosts

When you reach your destination you have a view of a building (again very well done) with a ghost (or slimer) whizzing around outside You drop your trap and position your crew so the slimer is confined above the trap, then fire "Ghostbusters!" the machine shouts if you are successful (you also get some money for doing this), otherwise one of your team is zapped and complains, "He slimed me!"

The speech synthesis is very good indeed. All this is done to that theme tune which far from becoming monotonous is really very catchy

Why the early release? Because *Ghostbusters* the game is really just as good as the film. It isn't the most testing arcade game in the world, neither is it the most original but what David Crane has produced is a game that is incredibly good fun to play and is faithful to the spirit of the film.

John Cook

★★★★★

Useful

Program *BBC Micro Utilities* **Price** £6 95 **Micro** BBC B **Supplier** Shiva Software 64 Welsh Row, Nantwich, Cheshire

Bruce Smith has produced a number of books on assembly language programming on the BBC micro

Now this cassette offers *Beemon*, a useful monitor program, and 17 of the longer machine-code routines from his book *BBC Micro Assembly Language* which is available separately from Shiva at £7 95

Beemon allows you to study sections of the Beeb's memory From its opening menu a disassembler option translates machine-code into the friendlier assembler form and even shows the ASCII characters concerned where appropriate The monitor option lets you see memory and register contents and even allows you to modify these directly (It sensibly prevents direct modification of the stack pointer which could cause chaos!) The *Step* option lets you go line by line through a machine-code program and *Dump* lets you study sections of memory on screen or on a printer

Two further menu options are *Memmove* to shift code from one place to another, though you should avoid &E00 to &41FF where *Beemon* itself resides and *Fill* which lets you fill a specified area of memory with various characters Finally, the program lets you access the Beeb's cassette interface so that you can *Save* and *Load* blocks of code

The monitor program is useful enough but for the regular assembly coder the series of routines which follow may save a lot of typing time

A useful and sensibly priced package

Dave and Jan Watterson

★★★★

Role-play

Program *The Secret River — Adventure One in the Runemagic Series* **Price** £7 95 **Micro** BBC B **Supplier** Triffid Software Research, Cullwood Lane, Ashley, New Milton, Hants

This game is tailor-made for Dungeons and Dragons fans Here is an adventure that responds to the character playing it — and the outcome will change depending on the strengths and weaknesses of that character

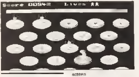
The first step in playing the game is to load a character generator program. This assigns a set of attributes and an amount of money to your persona The money can be used to buy weapons, spells and armour Here a certain amount of skill must be applied in the choices you make.

The game is a fantasy story where the object is to locate and drink from a magical green river which is guarded by trolls. The usual tasks are presented — finding and using various objects on the journey; fighting and casting spells However the outcome of fights and dangers will be affected by the skills and weaponry of your character; and his or her luck will also vary

When you have succeeded you can save your character's newly developed skills and talents, put them through the character generator again and start afresh with a higher level of spending and abilities.

Dave and Jan Watterson

★★★



Dan the Man

Program *Hot Shoe* **Micro** MSX **Price** £5 99 **Supplier** Eclipse Software, Longman House, Burnt Mill, Harlow, Essex.

Early in the working life of any new micro it is difficult to be particularly critical about the games released for it

It does take time for programmers to learn the strengths and weaknesses of a system, and tailor games to suit

So when I say that *Hot Shoe* is one of the best MSX games I have seen so far don't get too excited about it.

You are Dan the Atomiser Man who as usual, is charged with the task of saving the Universe — this time from an exploding Reactor

In the first screen, you manoeuvre your spaceship left right across the bottom of the screen, avoiding on coming asteroids (yawn) Crashing into one will drain your energy which you will need in the next screen

Having negotiated the asteroid belt and reached the reactor, you are beamed into the reactor core itself a 3 D grid of coloured discs These discs are numbered 1 to 6 and are counting up, towards 7 At this stage they flash and become permanently red, that is critical If all the discs (all right then, reactor cores) reach this terminal state, the Universe explodes and the game is over

You stop this from happening by jumping from disc to disc every time you land on a 'core' its number is reduced by one On reaching zero, they turn green. Stray 'atoms' hinder you in this task by jumping around the grid draining your energy on contact. You need this energy for jumping around the grid, sapping atoms and on higher levels, deterring a robotic adversary

Okay then, *Hot Shoe* isn't going to persuade anyone to swap their Spectrum for an MSX, but for first time buyers it should prove entertaining

John Cook

Mystery

Program *Sherlock* **Micro** Commodore 64 **Price** £14 95 **Supplier** Melbourne House, Castle House, Castle Yard, Richmond.

"Well Watson, I wonder what you make of the curious business of Mrs Brown and Mrs Jones The case has some interesting points to it although our public transport system seems unnecessarily complicated these days

Sherlock has now reached the 64 though the conversion certainly hasn't made Watson any more intelligent, nor Lestrade any less obtuse Nor does the Commodore seem immensely impressed when Sherlock makes some brilliant deductions such as the fact that he's never going to reach King's Cross at all unless he remembers to get out of the hansom cab first

Melbourne House's Inglish allows for some fairly sophisticated input, and simple graphics and reams of text scroll up smartly as required. However, because the game is played in 'real time', you need to get all the relevant movements more or less word perfect in order to turn up at the right places on time

The game plays slightly differently each time as well, just to throw you off-beam when you decide to have one more go

Melbourne House claims the vocabulary enables you to interrogate the suspects' and 'discuss the case' — so far I have to admit my interrogation is limited to "Tell me your alibi" Lestrade tells me not to be silly when I attempt a reasonable discussion, and Watson keeps getting lost (last seen heading south down Leatherhead High Street)

The whole thing is maddeningly frustrating I suspect it could well have stumped the real Holmes.

Personally I reckon Major Percival Ffoulkes did it, but then so does Lestrade and he never got it right in the books

Christina Erskine

Frustrating

Program *Underwurlde* **Micro** Spectrum 48K **Price** £9 95 **Supplier** Ultimate-Play the-Game, The Green Ashby de la Zouch, Leicestershire

Underwurlde is everything you expect from an Ultimate game Technically excellent with an ingeniously imaginative and well implemented game concept that is fiendishly difficult

So why do I find playing the game so annoying? Not challenging just a pain.

The game itself starts with your nicely animated persona in a multi-levelled complex of caves, connected by natural shafts and chimneys. You move around by jumping and to travel up you can hitch a lift on passing bubbles of volcanic gas. Your task deliberately vague is to locate and take some weapons scatterd around the complex (an axe, a sword and a bow I think) then go on to fight the 'devil in his lair' I can promise you, this is not going to be easy You are constantly attacked by various well designed floating nasties who don't kill you they just push you around (although this itself can be fatal if you are pushed off the bubble of volcanic gas you are travelling up a shaft on, and consequently plummet down four levels to your doom).

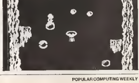
This is what I found so infuriating I can take being shot to bits in *Elite* I don't mind being dissipated in *Tir Na Nog* But you try being pushed around for the best part of the evening and see if you like it.

If you have a weapon you can kill them off easily enough, but still more come on nudging you off ledges and generally getting in the way I'm a pretty even tempered bloke, but the Spectrum came *that* close to being thrown out the window Let me promise you — *Knight Lore* is a lot more relaxing

Having said that, it's big — *Underwurlde* has at least 250 locations by my reckoning — a lot of people are going to buy it, and quite right too

And it's going to be a bumper New Year for Spectrum repairers

John Cook



5 WINNING CLASSICS FROM

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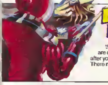

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The QL Page

Beyond Basic

Adam Denning takes a look at three new language packages for the Sinclair QL

Various software companies seem to be working overtime to back up Sinclair's assertion that the QL is a serious machine. There are now a number of assemblers, a BCPL compiler, a Pascal compiler and a Lisp interpreter with promises of a full ISO Pascal and Lattice C to come.

This would make the machine capable of supporting almost as many languages as the BBC micro, and also make it a much more viable proposition to other software houses who have previously been waiting in the wings, wondering whether the QL is going to be worth supporting or not.

Pascal from Computer One. Computer One, Science Parts, Milton Road, Cambridge CB4 4BH. Price £39.95.

The first language package for the QL — apart from SuperBasic was a Pascal compiler from Computer One. This package costs £39.95 and comes on a microdrive cartridge complete with a respectably long manual. It is not a true compiler as the time-honoured system of compiling into a compact code which is then interpreted at run time is used. This code occupies far less space than the corresponding true 68000 machine code, but it is of course slower.

The Pascal package must be seen as a system in its own right rather than as a development environment as the compiled programs cannot be run outside of the package. The Pascal program is started by the normal auto boot process and this saves some resident procedure space to put a procedure called simply *Pascal* into. Invoking this procedure from SuperBasic — by typing its name and pressing *Enter* — loads the whole Pascal system from microdrive and enters the command state.

This stage is represented by a menu with eight options from source editing to file deletion. The operation most likely to be undertaken first is the compilation of the example programs given. These range from the *Towers of Hanoi* problem to a microdrive back-up utility, using decidedly non-standard Pascal to access the QDOS trap routines. To be accepted by the compiler each source file must be terminated with *-pas* and the object code produced is given the *-qlp* extension, standing for 'QL Pascal'.

All the examples compile of course, but only the back-up utility can be described as useful. The compilation process is rather slow, perhaps because the compiler is itself written in Pascal and therefore has to be interpreted. Whatever, the resultant code is immediately executable simply by selecting the *Run* option and typing in the filename in response to the prompt. This highlights one of the more useful aspects of the system, as the compiler and the rest of the Pascal system has to reside in mdv1 it is assumed that the source and resultant object will be on mdv2, so the system defaults to that drive. This means that to compile a program called, say, *mdv2-testprog-pas*, one has to type only testprog for the compiler to find the file and act on it. Running the program follows the same principle.

The editor is invoked from menu option 1 and will accept any form of filename, so it could be used to edit almost anything. However it is in by no means the most ideal form being only a very basic screen editor which does not have repetitive or block commands. It does have two virtues, though. Starting a new line will cause the cursor to be positioned directly under the first character on the previous line, thus giving a degree of automatic indentation. More usefully, if a Pascal program is compiled with errors, these errors are introduced into the source file at appropriate points. Subsequent editing of this file makes debugging a much simpler process, as the errors themselves cannot be edited out but are removed by the compiler when they are no longer a true representation of the error.

The language itself is an extremely odd version of Pascal, with many standard features and an awful lot of non standard ones. The code is by no means portable — no other system could support the added features, yet almost every program written will want to take advantage of them. The ability to get as close to machine code as this system allows is great for the budding systems programmer, but the whole object is defeated when it is remembered that no program can run on its own — in other words the programs always have to be executed in the Computer One Pascal environment. If a commercial software house were to develop programs using this package it would find it impossible to distribute the product as there would have to be an assumption that every user has a Computer One Pascal compiler!

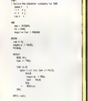
So one's whole understanding of why one should purchase a Pascal compiler is turned upside down by this Computer One product — it is great for learning the language and writing utilities for individual use on the QL, but as a product development system it doesn't enter the running. If Computer One could be persuaded to distribute the interpreter and run-times separately then this situation could change.

The short example of the language in action (see listing 1) simulates a procedure to read in a decimal number from the current input device. The program is an example of how programs written in BCPL might be converted to Pascal. From the same example given later in BCPL it is easy to see not many people would care to simulate it in Pascal.

BCPL from Metacomco, 26 Portland Square, Bristol BS2 8RZ. Price £59.95

QL BCPL by Metacomco is the most useful language currently available for the QL. It compiles to true 6800 machine-code and is written in such a way that the programs can be run as independent jobs — they will multi-task with whatever is going on elsewhere in the machine.

The system comes supplied with the necessary compiler files, a linker and a screen editor. This editor is destined to be the most used editor on the QL as almost every product requiring an editor, including those from rival companies, is supplied with it.



BCPL is a very unusual language which has sadly been neglected by the home computer user but which is used extensively in the development of commercial software by many Cambridge based companies. The language is the grandfather of C, now very much in vogue for software development. BCPL still retains its unique flavour though with two major concepts. There are no data types in the language — no integers, floats, reals, booleans or whatever. Everything is represented by the BCPL word, which in this implementation is 32 bits wide. The word can hold any data type, be it a machine address, a number or a pointer, and consecutive groups of words can be identified as a vector which is the closest BCPL gets to an array. This lack of data types means that the language is unbelievably flexible but it does make the programmer totally responsible for any notional meaning of a word. The idea of a vector is fundamental to the second important BCPL concept — the global vector. This is an area of store devoted to holding such things as the addresses of procedures and functions, the values of variables which may be changed by the whole system and any other data which the programmer wishes to make global.

As the global vector is always at a defined point within the run-time system it is a very simple process to introduce program overlays — section of code which can be loaded during a program run, linked into the global vector and used, then unlinked and removed. Consequently programs which in total would be much larger than the machine Ram available can be compiled and successfully run.

BCPL is also rich in semantic structures, so that the repetition commands include *While..Until*, *Repeat..While* and *Repeat..Until*. All the more popular constructs available in C all have their origins here — the conditional expression, the common *Start* (main in C) procedure and section brackets.

BCPL is very easy to learn and surprisingly easy to read, it is a well thought out mixture of high level and low-level ideas, so it is ideal for the systems programmer. It has been used to write editors, assemblers, compilers, interpreters and almost anything else you could think of. It has clear Input/output handling and the ability to interface machine-code routines with ease — through the global vector.

BCPL for home micros was first ease on the BBC micro, where a highly sophisticated system in Rom can be bought for a rather high price.

The Metacomco QL implementation is very similar and as long as one is aware of the difference in data sizes and channel opening conditions, programs written on one machine will successfully compile and run on the other. QL BCPL lacks a few of the more esoteric procedures supplies with Acornsoft BCPL, but the two packages are similar enough to show the universal nature of BCPL. QL BCPL also includes numerous routines to take advantage of the QL's facilities such as windowing as well as a set of superior floating-point procedures.

If the Acornsoft implementation seems more comprehensive at first sight this is only because it is supplied as a language Rom intended to supplant Basic, while the QL system is intended to augment QDOS for those programmers who require the facilities available to them from BCPL. The other major difference between the two version is that Acornsoft's BBC BCPL is compiled into a compact interpretive code called Cintcode while the QL compiler produces pure 68000 code. This in turn means that programs written in BCPL on the QL will run on any QL regardless of whether the end user has a compiler or not.

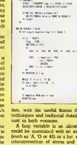
The BBC micro version won't allow this without the purchase of an additional packages are written in BCPL using its own consider that all of Metacomco's new QL packages are writeen in BCPL using its own BCPL program.

The example program of BCPL in operation shows the *ReadN* procedure.

Lisp from Metacomco, 26 Portland Square, Bristol BS2 8RZ. Price £59.95.

QL Lisp is another Metacomco product again selling at £59.95. Most of the development was carried out by Dr Arthur Norman and JP Fitch, who worked on the Acornsoft Lisp product on the BBC micro and Electron. For this reason QL Lisp is susbstantially similar to the Acorn product but has the added virtue of being two years younger and therefore rather more versatile.

Nevertheless, anyone considering buying it as a Lisp tutorial aide would be well advised to buy the Acornsoft book *LISP on the BBC micro* by Arthur Norman and Gillian Cattell. Every example in that book which does not use functions specific to the BBC micro will work on the QL implementation, with the useful bonus that all the techniques and technical details are relevant to both versions.



A Lisp variable is an identifier which could be associated with an atomic value (such as 'A, 'O or 43) or a list which is an interconnection of atoms and other lists, with the smallest possible list being the () null lists. It is more difficult to describe Lisp succinctly than other programming languages, so perhaps the example listing of a Lisp program shown here helps. It performs essentially the same function as the Pascal and BCPL examples, but the similarity is very difficult to spot!

QL Lisp is supplied on microdrive with numerous examples and a reasonable manual, describing all the built-in functions and variables and explaining how to use the Lisp system. Apart from the multi-tasking capability the similarity to Acornsoft Lisp is obvious so all your favourite predefined Beeb functions can be transferred across to the QL and used in this new environment.

The major difference between the two Lisp versions is the full turtle graphics package supplied with the QL Lisp, allowing easy graphics routines and the addition of many of the functions which were 'missing' from Acornsoft Lisp, such as *Append*. File handling, although superficially the same, somehow comes across as being more natural on the QL. Preparing a source file with the supplied editor and then using the *Rdf* function to read it in seems the obvious thing to do. Functions such as this make Lisp program development that much easier.

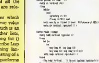
Lisp has been frequently described as the natural language for export systems writing, but its capabilities are by no means limited to that area. The example shows (not necessarily very elegantly) that the language is also capable of the more basic computational requirements. In theory at least, most applications could be written in Lisp. This is unlikely to be a good idea as the interpretation of the code takes some time. When 512K is available for the QL and Metacomco fulfills its promise of a full Cambridge Lisp for the machine, then perhaps Lisp can be used more seriously. As it stands at the moment this system is only really useful as a teaching aid, but at that it performs admirably.

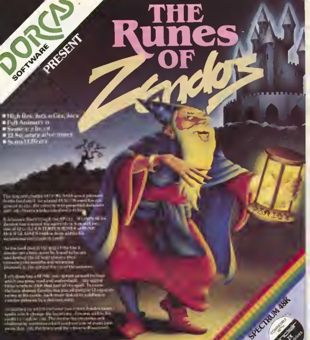
Conclusions

Computer One Pascal. Unless you're desperate, wait for the full ISO Pascal compiler.

Metacomco BCPL. It's my favourite language so I'm a little biased, but the serious programmer would undoubtedly find it a useful purchase.

Metacomco Lisp. If you want to learn the language or are capable of thinking up some things to do with it, then this package is probably for you. It's likely to be the best Lisp for the QL until Metacomco brings out its larger version.

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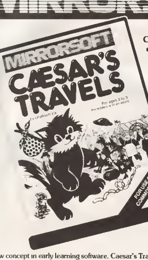

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Think you can design an arcade game? This is your chance to put all those great ideas into practice We want you to design the sequel to Elite's *Kokotoni Wilf*.

Kokotoni Wilf from Elite Software — one of this Autumn's top selling games on both the Commodore 64 and the Spectrum is to have a sequel The plot? — that's for you to decide!

Popular Computing Weekly offers you the chance to use your own ideas, characters, plot and so on to create the sequel to *Kokotoni Wilf* which will be published by Elite in the new year

The winner(s) will be credited with the storyline design in all advertising and promotion, and the winner(s) name(s) will be featured in the packaging In addition, a royalty of 6% of sales achieved will be paid to the winning designer or design team.

What we want you to do

The competition is open to both individual designers or design teams. You are not asked to actually program the game All you have to do is to prepare a storyboard — a series of screen drawings or sketches — for the sequel which should explain the action from the first screen to the last.

The finished storyboard should be detailed enough for Elite programmers and designers to use without any major changes — set yourself a limit of no less than 20 screens of action and no more than 60 It might be helpful to divide your storyboard into two sections, a general guide to the story including overall objectives and method of scoring, etc (limit yourself to a maximum of 800 words) The second section should be much more specific detailing exactly what is going on where in each screen, indicating such things as sprites, background layout and movement paths To help you, we show on the right one such storyboard from a screen in the first *Kokotoni Wilf* program

How to enter

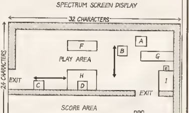
Completed storylines and storyboards should be submitted to Kokotoni Wilf Competition *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP to arrive no later than 1 January 1985

All entrants requiring an acknowledgement of receipt should submit a stamped self-addressed envelope. Entrants requiring their work to be returned after judging should send a suitable post paid self addressed envelope with the entry

The judges decision will be final. Don't forget to include your name and address! Ten runners up will receive copies of the game which will be produced for the Spectrum and Commodore 64

It is important to remember that the program you create is to be a sequel and so, in a general way, you should maintain the theme and atmosphere of the original For anyone not familiar with *Kokotoni Wilf* here is the story so far:

> *"Legend has it that many hundreds of years ago somewhere in Northern Europe lived a great Magician known as Ulrich. Ulrich knew of a magic amulet, fragments of which had been scattered throughout time Ulrich wished to wield its power but he was too old and infirm for such an arduous adventure and so charged his protege Kokotoni Wilf with the epic task Ulrich sent Wilf back in time to the age of the great dinosaurs, there to begin his quest through the ages for each fragment of the Amulet Ulrich has provided Wilf with magic wings and time gates to pass from age to age — your task is to guide Wilf in his epic quest."*



TIME ZONE 3 SCREEN 1

A STARTING POSITION OF KOKOTONI WILF
B STARTING POSITION OF 'BOOK' SPRITE
C STARTING POSITION OF 'BOILING POT' SPRITE
D ANIMATED 'FIRE' SPRITE
E LOCATION OF AMULET FRAGMENT
F, G, H, I SKULL SHELF, POTS SHELF, OPEN RANGE, SKELETON

BOLD ARROWS SHOW SPRITE MOVEMENT PATTERNS
SHADED AREA SHOWS IMPENETRABLE BORDERS

Question time

A testing time for 64 owners with the Question and Answer Module by ***Dominick Devlin***

The Question and Answer Module is a ready-made component for an educational program in which a testee is asked a set of questions or can choose between several sets. The user programs the questions with their answers, the Module displays each question on the screen lets the testee input his answer, checks if it is right and displays the result. Each question is automatically numbered.

The Module, a machine-code routine, can be entered by means of the instructions listed at the end of this article The educational program should preferably consist of two separate parts the first part containing the instructions for the Module, followed by instructions to load and run the second part containing the actual questions and answers

The questions and answers are written like lines of print statements except that instead of the instruction *Print*, there is the letter 'q' for a question line and 'a' for an answer line. Each question must be immediately followed by its answer or alternative answers

A question can take up more than one line just put a *q* at the beginning of each line Alternative answers must be placed on separate lines, each beginning with the letter *a* All characters, including colour and cursor ones can be put in 'q' and 'a' lines The symbol ← will be understood as a carriage return The symbol from the f7 key will be replaced by inverted commas

Before the first *q* line is reached the Module must be called. This is done by the instruction *Sys 49152*, placed at the end of the preceding line Before that instruction, the Module needs to have some information poked into locations 251 and 252 251 should be poked with *0*, *1* or *2* (or only *0* or *1* when the Module is first called)

'0' will allow the testee to see the questions questions and input his answers. It will wipe out any previous answers he has given '1' is the same as '0' except that each answer will be immediately checked, and the testee will be told the result (including the correct answer)

'2' allows the testee to see the questions again, together with his previous answers The answers are checked and the testee is told the results. Location 252 must be poked with the lowest ASCII value to be considered in the comparison of answers. The value must be at least 35

This is one of the ways in which the programmer can increase the intelligence of the Module so that it recognizes an answer as right, even if it is not exactly the same as the programmed answer With 35 poked into 252 the Module ignores space and colour/cursor keys etc (even when their value is greater than 128), as well as differences between upper and lower case With *Poke 252,46* most punctuation signs will also be ignored

In addition, the programmer can get the Module to accept for example, both "encyclop-aedia" and "-edia" by putting, in the place of the hyphen, the symbol produced from the f5 function key I shall come back to the f5 key in a moment.

As soon as the Module reaches a line that does not begin with 'q' or 'a', it exits and the instructions reached are handled as Basic instruction. Two pieces of information are left in locations 253 and 254. Peek (253) for the number of questions answered correctly and Peek (254) for the number of questions asked.

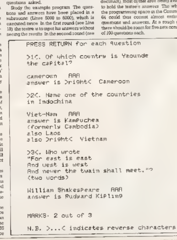
Study the example program The questions and answers have been placed in a subroutine (Lines 5000 to 6000), which is executed twice In the first round (see Line 10) the testee is to input his answers without seeing the results In the second round (see Line 30), he will see the questions again, together with his answers and the correct answers In addition to the differences automatically ignored no account will be taken for example of hyphens or brackets

The testee must be told to press *Return* to see each question (Line 20) After the last question has been reviewed, the final result will be displayed (Line 40) Also shown is what might appear on the screen in the second round.

The answers input by the testee have been marked with *AAA* This extra input was not seen by the Module If the testee's answer corresponds to the programmed answer up to the end of the answer line, or up to the symbol from the f5 key the Module stops comparing and displays *answer is right* The f5 symbol was used in Lines 5040 and 5060 to allow for the French spelling of Cameroon

To break out of the question and answer routine insert the symbol "18" in the top left corner of the screen and press *Return*

The Module itself is perched at the top of the area *$C000* to *CFFF* (49152 to 53247 in decimals) most of that area being available to hold the testee's answers The whole of the programming space in the Commodore 64 could thus consist almost entirely of questions and answers. At a rough guess, there should be room for five sets consisting of 100 questions each.



```
PRESS RETURN for each question

>1<. Of which country is Yaounde
the capital?

cameroun   AAA
answer is >right<  Cameroon

>2<. Name one of the countries
in Indochina

Viet-Nam   AAA
answer is Kampuchea
(formerly Cambodia)
also Laos
also >right<  Vietnam

>3<. Who wrote
"For east is east
And vest is west
And never the twain shall meet."?
(two words)

William Shakespeare   AAA
answer is Rudyard Kipling


MARKS· 2 out of 3

N.B. >...< indicates reverse characters
```

Example Program

```
1 rem test
5 Poke 53272,23 rem upper/lower case
10 Poke 251 0 gosub 5000
20 Print"█PRESS PETURN for each question"                    CLR
30 Poke 251 2 Poke 252,46 gosub 5000
40 Print"MARKS ",Peek (253),"out of",Peek (254)
50 end
5000 sys 49152
5030 q"Of which country is Yaounde←the capital?←"
5040 a"Camero█on"                                              f5
5050 q"Name one of the countries←in Indochina←"
5060 a"Kampuchea█←(formerly Cambodia)"                         f5
5061 a"Laos"
5062 a"Vietnam"
5070 q"Who wrote ←█For east is east←And west is west"              f7
5080 q"And never the twain shall meet.█?←(two words)←"             f7
5090 a"Rudyard Kipling█←"                                      f5
6000 return
```

Main Program

```
10 REM *QUESTION & ANSWER MODULE*
20 FOR P=49152 TO 49461
30 READ D POKE P,D NEXT END
100 DATA 160, 0, 132, 253, 132, 254, 132, 90, 169, 53
110 DATA 133, 93, 169, 193, 133, 96, 133, 94, 140, 47
120 DATA 193, 140, 48, 193, 140, 49, 193, 173, 0, 4
130 DATA 240, 23, 160, 3, 177, 122, 133, 57, 200, 177
140 DATA 122, 133, 58, 200, 177, 122, 201, 65, 240, 125
150 DATA 73, 81, 208, 1, 197, 96, 240, 51, 230, 254
160 DATA 133, 96, 165, 251, 41, 2, 240, 3, 32, 207
170 DATA 255, 162, 2, 189, 47, 193, 41, 15, 56, 233
180 DATA 9, 105, 58, 176, 2, 169, 48, 157, 47, 193
190 DATA 202, 144, 236, 162, 25, 32, 8, 193, 165, 90
200 DATA 24, 101, 93, 144, 2, 230, 94, 133, 93, 160
210 DATA 5, 200, 177, 122, 208, 2, 169, 141, 201, 34
220 DATA 240, 245, 201, 95, 208, 2, 169, 13, 201, 136
230 DATA 208, 2, 169, 34, 32, 210, 255, 201, 141, 208
240 DATA 225, 160, 2, 170, 177, 122, 136, 208, 250, 168
250 DATA 240, 2, 134, 123, 136, 132, 122, 76, 27, 192
260 DATA 32, 207, 255, 145, 93, 200, 201, 13, 208, 246
270 DATA 32, 210, 255, 208, 32, 132, 91, 160, 0, 132
280 DATA 92, 166, 96, 240, 4, 162, 11, 208, 20, 230
290 DATA 96, 165, 251, 41, 2, 240, 219, 177, 93, 32
300 DATA 210, 255, 200, 201, 13, 208, 240, 132, 90, 165
310 DATA 251, 240, 184, 32, 8, 193, 162, 16, 230, 91
320 DATA 164, 91, 177, 122, 240, 30, 201, 135, 240, 26
330 DATA 164, 92, 41, 127, 197, 252, 144, 236, 133, 88
340 DATA 230, 92, 177, 93, 41, 127, 197, 252, 144, 226
350 DATA 197, 88, 240, 220, 208, 5, 32, 8, 193, 230
360 DATA 253, 76, 109, 192, 199, 20, 193, 32, 210, 255
370 DATA 232, 201, 32, 208, 245, 96, 141, 65, 78, 83
380 DATA 87, 69, 82, 160, 73, 83, 32, 65, 76, 89
390 DATA 79, 32, 18, 82, 73, 71, 72, 84, 146, 58
400 DATA 32, 13, 18, 0, 0, 0, 146, 46, 32, 13
```

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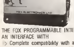

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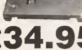

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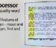

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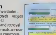

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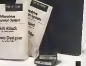

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A swing to the right

The second of three machine-code routines for the Dragon 32 by ***Roger Walton***

This week's article gives Basic listings for machine-code routines which will scroll the *PMode 3* screen to the right and upwards. The right scroll routine includes wrap-around but the upwards scroll does not.

In both cases the full width of the screen is scrolled but the vertical extent of the scrolled screen area may be set by the user. This is done by *Poking* the two Y-co-ordinates as shown in the Basic listings 2 and 3. The code is stored at different addresses, so that they can both be used together in a program.

Once the Basic programs have been run, the machine-code can be stored by using the *Csavem* command. An example would be:

Csavem "Rscroll",&H7EC2,&H7E5E,&H7EC2

the third address being the *Exec* address of the routine.

Listing 2

```
100 ' LISTING 2
110'*****************************
120'SCROLL PROGRAM, R. Walton,
130'*****************************
140'150 ' This program scrolls
PMODE 3 or 4 up the screen160 '
170 ' The section of the screen
to be scrolled
180 ' is defined by it's lower
and upper Y coordinates which
should
190 ' be POKED into &H7E80 and
&H7E81 before EXECing the
machine code
200 CLEAR 100,&H7E78
210 FOR LOC=&H7E79 TO &H7EC0
220 READ P$
230 P$="&H"+P$240 P=VAL(P$)
250 POKE LOC,P260 T=T+P
270 NEXT
280 IF T<>7951 THEN CLS:PRINT
"DATA ERROR":STOP
290CLS:PRINT"DATA LOADED"
300PRINT"USE EXEC &H7E79
310PRINT"TO CALL THE SCROLL
320DATA 16,00,06,06,00,10,FF,00
330DATA 8F,86,20,F6,7E,80,3D,C3
340DATA 06,00,FD,7E,7C,86,20,F6
350DATA 7E,81,3D,C3,06,1F,1F,02
360DATA 31,A8,E1,10,BF,7E,7E,8E
370DATA 7E,7C,A6,88,20,A7,80,BC
380DATA 7E,7E,26,F6,4F,10,BE,7E
390DATA 7E,31,A8,20,10,BF,7E,7E
400DATA A7.80.8C.7E.7E.26.F9.39
```

Listing 3

```
100'LISTING 3
110'*****************************
120' SCROLL PROGRAM, R. Walton
130'*****************************
140'
150 ' This program scrolls PMO
DE 3 graphics right
160 ' across the screen, with
wrap-around built in
170 'The section of the screen
to be scrolled
180 ' is defined by it's X and
Y coordinates which should
190 ' be POKED into &H7EC9 and
&H7ECA before EXECing the mach
ine code
200 CLEAR 100,&H7EC1
210 FOR LOC=&H7EC2 TO &H7F5E
220 READ P$ 230 P$="&H"+P$
240 P=VAL(P$)250 T=T+P
260 POKE LOC,P270 NEXT
280 IF T<>16932 THEN CLS:PRINT
"DATA ERROR":STOP
290CLS:PRINT"CODE LOADED."
300PRINT"EXEC &H7EC2 TO"
310PRINT"CALL RIGHT-SCROLL"
320STOP
330DATA16,00,0B,06,00,1D,FF,00
340DATA00,00,00,00,00,00,86,20
350DATAF6,7E,C9,3D,C3,06,00,FD
360DATA7E,C5,86,20,F6,7E,CA,3D
370DATAC3,06,1F,FD,7E,C7,8E,7E
380DATAC7,7F,7E,C8,31,88,E1,10
390DATABF,7E,CE,7F,7E,CC,A6,84
400DATA85,01,26,27,85,02,26,2E
410DATA64,84,64,84,1C,FE,30,1F
420DATA8C,7E,CE,25,05,17,00,29
430DATA20,F2,A6,01,8A,7E,C8,8A
440DATA7E,CC,A7,01,8C,7E,C5,22
450DATAC8,20,39,34,02,86,40,87
460DATA7E,CC,35,02,20,CE,34,02
470DATA86,80,87,7E,C8,35,02,20
480DATAC7,C6,40,F7,7E,CD,C6,02
490DATA1C,FE,64,84,25,0D,34,04
500DATAC6,80,F7,7E,CD,35,04,5A
510DATA26,EE,39,A6,01,BA,7E,CD
520DATAA7,01,20,EA,39
```

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Completing the file

Continued from last week part two of Microfile by **Peter Patton**

After running the program you might want to create a new file After considering what was said last week about the art of file design, select option 1 from the Main Menu.

Answer the prompts as they appear on screen Firstly, enter the filename for this file, then the number of fields you will require NB If you allocate seven fields you must use seven fields, as blank field names are not allowed.

You will be prompted in turn for a field name and a field length for each of the fields The field name is just a label to allow you to identify the data segments If you make a mistake don't worry After entering all the field names and lengths you will be given the opportunity to amend any section.

Once you are happy that your file structure is as intended select the *Save* parameters option and follow the prompts to save the file parameters which you have just created. If you *Quit* without saving the parameters will be lost

Entering Data

Select option 2 from the *Main Menu* then select option 1 from the second menu. After *Loading* the parameters for the file, the record layout will be displayed on the screen, and you will get the prompt *Load Data File (Y or N)*. Answer 'N' You will then get the prompt *Begin A New Data File (Y or N)* answer this 'Y'

You are now ready to begin entering data into your file If you wish to leave a field blank then simply press *Enter* and you will see that the cursor moves to the start of the next field Note that you are not allowed to backspace out of the field, or to enter data beyond its preset limit.

Saving Your Data

At the end of a session entering data, it is always advisable to *Save* the contents of the file If you were to suffer a power cut before you had *Saved* the file, it would be lost. From the second menu select option 4 (Return to Main Menu), then from the main menu select option 3 (Save Data File) Follow the prompts and your file will be saved to cassette If you are using the same cassette for both the file parameters and the data file do not overwrite the parameters for the file! Leave a big gap between the end of the parameters and the start of the data file, then label the cassette

To load an existing data file, follow the procedure for starting a new file outlined above, however, when prompted to Load Data File (Y or N) answer yes Then follow the prompts to load your file You may now use options 2 and 3 from the second menu to explore the file To add new records to the file simply select option 2 from the second menu, and select the '+' to add a record.

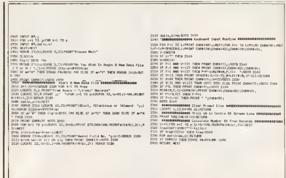
Finally, when searching for specific data in your files you will be allowed to search on a single field of your choice Such searches are set up in such a way as to find any ambiguous reference, and this can produce results which you may not expect. If for example you were looking for *Pat* to find the name *Paton* you would also turn up names like *Patterson*, *Patrick*, *Patton*, etc However, this feature is extremely powerful, and some of its usefulness would be lost if I were to take away its ambiguous aspects

Using the Program.

Program Menus

MAIN MENU	SECOND MENU
1 Create a New File	1 Load a New File
2 Run Main Program	2 Browse Through File
3 Save Data File	3 Search File
4 Exit From Program	4 Return to Main Menu

```
1170 '################ Search File ################
1180 FOR i=1 TO y:LOCATE 22,(i+5):PRINT STRING$(VAL(RIGHT$(f$(i),2)),4
5);:NEXT
1190 GOSUB 2310:LOCATE 20,23:PRINT"Search On Field No. ";:l=2:GOSUB 21
50:h=VAL(m)
1200 IF h<1 OR h>y THEN PRINT CHR$(7):GOTO 1180
1210 GOSUB 2310:LOCATE 10,23:PRINT"Enter Data For Search":
1220 LOCATE 22,(h+5):l=VAL(RIGHT$(f$(h),2)):GOSUB 2150:s=m
1230 x=1
1240 IF INSTR(dat(x,h),s)=0 THEN 1280 ELSE GOTO 1290
1250 IF x>j THEN 1260
1260 GOSUB 2310:LOCATE 20,23:PRINT"(Q)uit or (R)e-run Search ";:l=1:GO
SUB 2150:m=UPPER$(m)
1270 IF m="Q" THEN 740 ELSE IF m="R" THEN 1180 ELSE PRINT CHR$(7):GOTO
 1260
1280 IF x<j THEN x=x+1:GOTO 1240 ELSE IF x>=j THEN 1360
1290 LOCATE 57,4:PRINT x;"  "
1300 FOR i=1 TO y:LOCATE 22,(i+5)
1310 PRINT dat(x,i);:h=VAL(RIGHT$(f$(i),2)):PRINT SPACE$(h-LEN(dat(x,i
)));:NEXT
1320 GOSUB 2310:LOCATE 10,23:PRINT"(Q)uit or (C)ontinue Search ";:l=1:
GOSUB 2150:m=UPPER$(m)
1330 IF m="Q" THEN 1260
1340 IF m="C" THEN IF x<j THEN GOTO 1280 ELSE IF m="C" THEN GOTO 1360
1350 PRINT CHR$(7):GOTO 1320
1360 GOSUB 2310:LOCATE 20,23:PRINT r;" END OF FILE REACHED ";r;CHR$(7)
:FOR w=1 TO 2000:NEXT:GOTO 1260
1370 REM ################ Save Data File ################
1380 IF flg=0 THEN CLS:m="N O T H I N G   T O   S A V E":GOSUB 2320
:FOR w=1 TO 3000:NEXT:CLS:GOTO 40
1390 CLS:m="S A V E   D A T A":GOSUB 2330
1400 w=j
1410 FOR x=1 TO w:IF LEFT$(dat$(x,1),1)="-" THEN j=j-1:NEXT
1420 s="Insert & Rewind DATA tape, then press "+r+" REC "+r+" & "+r+"
PLAY "+r:PRINT:PRINT:PRINT:GOSUB 2330
1430 s="Press "+r+" ENTER "+r+" when ready  ":PRINT:PRINT:PRINT TAB(FN
c(l));s;:l=1:GOSUB 2150
1440 ft=0:FOR x=1 TO w:FOR b=1 TO y:ft=ft+LEN(dat(x,b)):NEXT:NEXT
1450 OPENOUT ""
1460 fil$=name
1470 PRINT #9,fil$
1480 PRINT #9,ft
1490 PRINT #9,j
1500 FOR x=1 TO w:FOR b=1 TO y
1510 IF LEFT$(dat(x,1),1)="-" THEN 1530
1520 PRINT #9,dat(x,b)
1530 NEXT:NEXT
1540 CLOSEOUT
1550 RUN
1560 '################ Load File Parameters ################
1570 CLS:WINDOW #1,5,75,6,20:LOCATE 5,5:PRINT STRING$(70,131):LOCATE 5
,21:PRINT STRING$(70,140)
1580 LOCATE 10,23:PRINT"Insert File Parameters Tape Then Press ";r;" P
LAY ";r;" & ";r;" ENTER ";r;" ";:l=1:GOSUB 2150
1590 GOSUB 2310:LOCATE 10,23:PRINT"L O A D I N G   P A R A M E T E R
S"
1600 ON ERROR GOTO 2390
1610 OPENIN" "
1620 INPUT #9,name
1630 INPUT #9,y
1640 DIM f$(y)
1650 FOR x=1 TO y
1660 INPUT #9,f$(x)
1670 NEXT
1680 CLOSEIN:GOSUB 2310
1690 RETURN
1700 CLS:WINDOW #1,5,75,6,20:LOCATE 5,5:PRINT STRING$(70,131):LOCATE 5
,21:PRINT STRING$(70,140)
1710 FOR x=1 TO y:a=STR$(x)
1720 IF LEN(a)=2 THEN a="0"+RIGHT$(a,1) ELSE a=RIGHT$(a,2)
1730 PRINT #1,a:NEXT
1740 FOR x=1 TO y
1750 LOCATE 9,(x+5):PRINT LEFT$(f$(x),10)
1760 LOCATE 20,(x+5):PRINT"( ";STRING$(VAL(RIGHT$(f$(x),2)),45);" )":N
EXT
1770 LOCATE 5,4:PRINT"Active File ";name:LOCATE 50,4:PRINT"Record  000
"
1780 RETURN
1790 LOCATE 5,23:PRINT"Load data File ( Y or N ) ";:l=1:GOSUB 2150:m=U
PPER$(m)
1800 IF m="N" THEN 1970 ELSE IF m="Y" THEN 1830
1810 PRINT CHR$(7):GOTO 1790
1820 '################ Load Data File ################
1830 GOSUB 2310:LOCATE 10,23:PRINT"Insert Data Tape The Press ";r;" PL
AY ";r;" & ";r;" ENTER ";r;:l=1:GOSUB 2150
1840 GOSUB 2310:LOCATE 10,23:PRINT"L O A D I N G   D A T A"
1850 OPENIN""
1860 INPUT #9,fil$
1870 INPUT #9,ft:GOSUB 2330
1880 IF fil$<>name THEN 1960
1890 GOSUB 2310:LOCATE 10,23:PRINT r;" DATA & PARAMETER FILE MISMATCH "
;r:FOR x=1 TO 2000:NEXT:CLOSEIN:ERASE dat:GOTO 1830
```



```
1900 INPUT #9,j
1910 FOR x=1 TO j:FOR b=1 TO y
1920 INPUT #9,dat(x,b)
1930 NEXT:NEXT
1940 GOSUB 2310:LOCATE 5,23:PRINT"Please Wait"
1950 CLOSEIN
1960 flg=1 GOTO 740
1970 GOSUB 2310:LOCATE 5,23:PRINT"Do You Wish To Begin A New Data File
 ( Y or N ) ";:l=1 GOSUB 2150:a$=UPPER$(a$)
1980 IF a$="N" THEN ERASE F$:GOTO 740 ELSE IF a$="Y" THEN GOSUB 2010:GOT
O 740
1990 PRINT CHR$(7);GOTO 1970
2000 '################ Start A New Data File ####################
2010 J=1 fl=0:GOSUB 2330 FOR J=1 TO free
2020 LOCATE 5,2 PRINT"Free Space - ";free;" Records"
2030 LOCATE 37,4 PRINT j;"  ":FOR z=1 TO y:LOCATE 22,(z+5):l=VAL(RIGHT
$(f$(z),2)) GOSUB 2150
2040 dat(j,z)=a:NEXT
2050 GOSUB 2310 LOCATE 10,23:PRINT"(Q)uit, (C)ontinue or (A)mend  ";:l
=1:GOSUB 2150:a$=UPPER$(a$)
2060 IF a$="Q" THEN flg=1:GOTO 740 ELSE IF a$="C" THEN 2090 ELSE IF a$="A
" THEN 2100
2070 PRINT CHR$(7) GOTO 2050
2080 FOR b=1 TO y:LOCATE 22,(b+5):PRINT STRING$(VAL(RIGHT$(f$(b),2)),"
"):NEXT
2090 J=J+1:free=free-1:NEXT
2100 GOSUB 2310:LOCATE 20,23:PRINT"Amend Field No. ";:l=2:GOSUB 2150
2110 b=VAL(a$):IF b<1 OR b>y THEN PRINT CHR$(7):GOTO 2100
2120 LOCATE 22,(b+5):l=VAL(RIGHT$(f$(b),2)) GOSUB 2150
2130 dat(x,b)=a:GOTO 2050
2140 '################ Keyboard Input Routine ####################
2150 FOR F=1 TO L:PRINT CHR$(45);:NEXT:FOR F=1 TO L:PRINT CHR$(8);:NEXT
:P=1:M$=SPACE$(L):PRINT CHR$(24);CHR$(42);CHR$(24);CHR$(8);
2160 I$=INKEY$
2170 IF I$="" THEN 2160
2180 V=ASC(I$)
2190 IF P=1 AND V=127 THEN PRINT CHR$(7);:GOTO 2160
2200 IF P>1 AND V=127 THEN PRINT CHR$(8);CHR$(42);CHR$(8);
2210 IF P>1 AND V=127 THEN P=P-1:MID$(M$,P,1)=" ":GOTO 2160
2220 IF V=13 THEN PRINT SPACE$((L+1)-P) M$=LEFT$(M$,(P-1)):RETURN
2230 IF V=44 THEN PRINT CHR$(7);:V=32:GOTO 2250
2240 IF V>31 AND V<123 THEN GOTO 2250 ELSE PRINT CHR$(7);:GOTO 2160
2250 IF P>L THEN PRINT CHR$(7);:GOTO 2160
2260 MID$(M$,P,1)=CHR$(V):PRINT CHR$(V);CHR$(42);CHR$(8);
2270 IF P<=(L+1) THEN P=P+1
2280 IF P=(L+1) THEN PRINT " ";CHR$(8);
2290 GOTO 2160
2300 '################ Clear Prompt Line ####################
2310 LOCATE 1,23 PRINT dl:RETURN
2320 '################ Print s$ in Centre Of Screen Line ##########
2330 PRINT TAB(20-LEN(s$)/2)s$:RETURN
2340 '################ Calculate Number Of Free Records ############
2350 tr=0 FOR x=1 TO y tr=tr+VAL(RIGHT$(f$(x),2)) NEXT
2360 free=INT((FRE("")-4L)/tr)
2370 IF free>32767 THEN free=5000
2380 DIM dat(free,y) RETURN
2390 IF ERR=10 THEN ERASE f$:RESUME 1640
2400 RESUME NEXT
```

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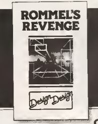

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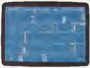

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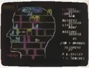

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Particle projection — mind your manners

Plot your flights of fancy with Projectile by ***P. Whitehurst***

I wrote this program to visualise how a particle behaves when projected at different velocities and different angles. The resulting program is suitable for a BBC Model A or B, or an Electron, as it utilises mode 4 graphics.

When run, the program asks you first for the velocity of projection, and then for the angle the particle is to be projected at. A graphical representation of its path is then drawn, with both axes labelled in metres.

After plotting its path the program asks if you would like to replot the path of a particle with different angle and velocity, or plot the path of the new particle over that of the old. Thus the paths of various different particles may easily be compared with each other.

The program does not make use of procedures, as such things would be considered to be overkill on the part of the programmer in such a straightforward program.

Program Notes

Lines 10-50 set up Mode 4. Input lines for velocity and angle are included with full error checking.

Lines 60-90 set up the screen, the scales being drawn in metres, and the variables for vertical and horizontal distance and velocity are set up. The direction of velocity is represented in Lines 150 & 160 as an arrow pointing in the direction of projection.

Lines 200-250 plot the path of the particle. The factor of 1/10th in each of the lines regarding a change in distance or velocity is to ensure that an accurate plot is obtained.

Lines 260-280 select whether a superimposed image or a complete replot of the drawing is required.

```
10MODE4
20VDU28,0,4,39,0
30PRINT'Simulation of the path of a particle    projected with velocity v m/s
 & at angleA degrees from a point O."
40INPUT'Velocity of projection,v(1-100m/s)",v:IFv<1OR v>100THENPRINT"Error!":
GOTO40
```

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```
   50INPUT'"Angle of projection,A(0-89deg)",A:IFA<0OR A>89THENPRINT"Error'":GOTO5
0
   60VDU29,80;100;5
   70MOVE1120,0:DRAW0,0:DRAW0,650:MOVE-20,630:DRAW0,650:DRAW20,630:MOVE1100,-20:
DRAW1120,0:DRAW1100,20
   80@%=0:FORF=0TO1000STEP100:MOVEF,-10:DRAWF,10:MOVEF,-20:PRINTF/100:NEXT
   90FORF=0TO600STEP100:MOVE-10,F:DRAW10,F:MOVE-40,F:PRINTF/100:NEXT
  100MOVE180,-50:PRINT"Horizontal distance(*100m)"
  110MOVE0,750:PRINT "Height'"(*100m)'
  120VDU24,0;0;1279;800;
  130dist=0:height=0
  140A=RAD(A)
  150MOVE0,0:DRAW200*COS(A),200*SIN(A)
  160MOVE180*COS(A+PI/32),180*SIN(A+PI/32):DRAW200*COS(A),200*SIN(A):DRAW180*COS
(A-PI/32),180*SIN(A-PI/32)
  170PLOT0,-20,60:PRINT"v":MOVE0,0
  180vertvel=v*SINA:horvel=v*COSA
  190VDU4
  200REPEAT
  210DRAWdist,height
  220dist=dist+horvel/10
  230height=height+vertvel/10
  240vertvel=vertvel-9.81/10
  250UNTILdist>1280 OR height<0
  260VDU28,0,4,39,0,12:PRINT"Press S to superimpose-F to replot"
  270IFGET$='S'THENVDU12:GOTO30
  280IFGET$="F"THEN:GOTO10
```

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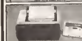

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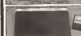

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We are always actively seeking programs for publication — either for Open Forum, the machine pages or Star Game When sending in a program for consideration, a clear program listing should be sent together with wherever possible, a saved copy on cassette Documentation — usually not more than 1000 words — should start with a general description of the program, what it does, and then some detail of how the program itself is constructed. We pay very competitive rates, according to the length and nature of the program and the quality of the accompanying documentation

Scrolling

on Spectrum

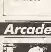
Innumerable scrolling routines have been published, many of them for the Spectrum. This one probably is the best in terms of memory consumption and speed. the program scrolls the whole screen left or right four pixels in just 38 bytes (19 bytes for each routine) The code itself is position-independent, but when using the Basic loader (see listing) the screen is scrolled left using *Randomise Usr 64000* and right using *Randomise Usr 64020*

The secret of the routines shortness is the use of the much underused BCD rotation instructions in the Z80's instruction set RLD and RRD In effect, the routine treats each line of the screen as a 32 byte long BCD number and rotates it left or right, hence appearing to move the line left or right by 4 pixels.

```
10 REM ********************
20 REM *   BASIC Loader   *
30 REM * For Left/Right   *
40 REM * Pixel scrolling  *
50 REM *                  *
60 REM *  By H.C.Dereli   *
70 REM ********************
80 CLEAR 63999
90 FOR f=64000 TO 64037  READ
 POKE f,a  NEXT f
100 DATA 243,33,223,87,14,191,6
32,175,237,111,43,16,251,13,32
245,251,201
 10 DATA 243,33,0,64,14,191,6,3
,176,237,103,35,16,251,13,32,24
 51,201
```

```
10 REM ********************
20 REM *   BASIC Loader   *
30 REM * For Left/Right   *
40 REM * Pixel scrolling  *
50 REM *                  *
60 REM *  By H.C.Dereli   *
70 REM ********************
80 CLEAR 63999
90 FOR f=64000 TO 64037  READ
 POKE f,a  NEXT f
100 DATA 243,33,223,87,14,191,5
 2 175,237,111,43,16,251,13,32,
245,201 201
 110 DATA 243,33,0,64,14,191,6,3
2 175,237,103,35,16,201,13,32,24
5 251,201
```

Arcade Avenue



No sprites

Elite is by any accounts a major piece of programming By combining its talent for arcade programming and its intellectual aspirations Acornsoft has produced a game that must pass as the closest simulation of what the space age could look like that we have yet seen on a micro

For those that don't know it is a kind of cross between a *Kingdom* strategy game, *Battlezone*, and a fully three dimensional flight simulator (I know all flight simulators are supposed to be 3D but in space you can fly at any angle you chose without worrying about a premature rendezvous with the ground) Unfortunately, it has confirmed a suspicion that I have long had that real space flight and especially space combat is so complex, disorientating and frustrating that it s best left to the battle computers whilst we humans get on with playing *Galaxian*.

Anyway for those with greater mental capacity and determination here is a tip that was passed on to me by one of our reviewers on how to dock with the space station. Find the point 'S that is halfway on the line between the planet and the station. Rotate to make the line horizontal and cut engines when the station is square with the side window Then rotate 90° adjust to point directly at the station, and rotate till the station is fixed like rectangle in view I hope that means more to Beeb owners than it does to me.

One of the most popular games of recent years amongst some of the *PCW* staff was Crystal's (now Design-Design Software) *Halls of the Things*. Personally, I have to agree with Tony Bridge s high estimation of this game because although it is now looking a bit dated graphically, I must rate it as the most lasting game in my collection in terms of addictivity

The good news is that it has now been released for the CBM 64 with the addition of a little sound and the welcome option of user defined keys and joystick control Otherwise, the game is an almost exact copy of the Spectrum original, even down to the simulated Spectrum loading screen. An Amstrad version is also underway

Design Design have also made a selling point of the fact that their new game *Dark Star* has no sprites Their contention is that sprite-based machines like the MSX range are limited in their graphic capabilities by this hardware commitment The company has preferred to concentrate on writing software, like Halls, where the programming effort has concentrate on writing software, like Halls, where the

Dark Star is therefore completely devoid of cute shapes with names like Rotten Ron and Berky Bill, but is rather a 'vector graphics' space game where you are faced with an interstellar flight of breathtaking speed worthy of a place in any alien basher's collection. The concept of user defined keys has also been stretched to its limit with most keys definable to perform any game function, or combination of functions that you may wish.

Finally, for those who think horrendous spelling gaffes are the prerogative of Tony Bridge's adventure games take a look at the adverts for Software Project's new game *Heebie Jeebies* where "you play the roll of a spider" In next week s column I will be playing the sandwich of a centipede

Tony Kendle

The Arcade Corner is a new section for anyone who enjoys playing arcade games. If you have any comments from playing tips on difficult games or programs you d particularly like to praise (or blame!) then write to Tony Kendle Arcade Avenue *Popular Computing Weekly* 12-13 Little Newport Street London WC2R 3LD

```
00010  ,Left and right
scroller
00020  ,in medium
resolution (4 pixels)
00030
00040  ,[ LEFT SCROLL ]
00050
00002          org  64000
00000
00060  lscrol ld   hl,22495
00070         ld   c,191
00080  l1     ld   b,32
00090         xor  a
00100  l2     rld
00110         dec  hl
00120         djnz l2
00130         dec  c
00140         jr   nz,l1
00150         ret
00160
00170  ,[ RIGHT SCROLL ]
00180
00190  rscrol ld   hl,16384
00200         ld   c,191
00210  ll1    ld   b,32
00220         xor  a
00000  ll2    rrd
00230         inc  hl
00240         djnz ll2
00250         dec  c
00260         jr   nz,ll2
00270         ret
```

Scrolling
by H Dersh

Retrieve

on CBM 64

This simple program will let you 'unnew' your newed basic program. Before you start typing in any magazine listings etc *Load* and *Run* the program.

Now type in *New* and enter in your listing normally. If by accident you do type in *New* while entering in your listing, follow out Step 5.

To test out the memory retrieve program do the following:

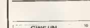
1 *Load* and *Run* the memory retrieve program
2 Type in *New*
3 Load in a Basic program and *List*
4 Now type in *New* and then *List*
5 Now type in *SYS50000* to retrieve your original program.

```
10 FORTG-2
20 READ AB
25 A=A+AB
30 PCKE5?00?+TC,AB
40 NEXTT
45 IFA<>2552THENPRINT DATA
SUM ERROR :EN

50 DATA169,2.160.1,145,43
60 DATA37,51,165.165,34
70 DATA133.145,133,47,133
80 DATA49.165,35.133.46
90 DATA133.148.133,50.96
```

Retrieve
by S Sindhar

GW6JJN



Packet Radio

To many of us, Packet Radio still seems the best bet in Radio Computing. It is a form of communication that is used in Amateur Radio in Canada and the United States, and slowly becoming more popular in the United Kingdom.

The reason for the rise in interest here is manifold. It means that many users can use the same radio frequency simultaneously, it means that data can be sent accurately and surely even in the most difficult conditions, and it is about 20 times faster than RTTY and AMTOR. When a network of intelligent terminals are set up, data can be routed from node to node with extremely high integrity.

One example of the rising interest is a letter to Microradio from Trevor Tugwall G8TJT of Stevenage, Herts. Trevor writes in to say that several people in the Hertfordshire area have been active on Packet Radio since the beginning of the year, experimenting with various protocols. They have finally settled by standardising on a program written by Peter Robinson G6GIX for the BBC Model B.

This program has proved popular mainly because of the ease with which it can be implemented not requiring any modems or interfaces and all input and output is via the cassette port.

The program has limitations such as the low baud rate of 300 baud, but it works effectively. To this end there is a regular Packet Radio net every Monday evening at 8pm on 144.675MHz which covers the Herts, Beds and North London areas. This particular frequency has developed as the regular packet frequency in the area and the program is spreading across the country as other local Packet groups develop.

In addition local amateurs have been experimenting with the Amateur Packet Standard AX.25 which they have running at around 1200 baud with very good results. Already they are capable of running five or six simultaneous independent contacts on the same frequency channel.

It is this economy of spectrum space that is the great appeal of Packet Radio on the crowded amateur bands. The AX.25 protocol is implemented by the use of a separate board with its own microprocessor Ram and Rom and has the obvious advantage that it can be run on any micro that has a serial RS232 port. The micro computer in fact acts just as a dumb terminal running a program capable of sending ASCII information through its serial port.

Thanks to Trevor and I would be very grateful to anyone else who can update this report with news of other Packet groups. I would very much like to see a circuit diagram or a prototype of the terminal board so if you have any information, please write in to the column.

Microradio has promoted the idea of Packet in the UK as the best solution to error free communication by computers in radio and I am glad to pass on any information that might help to advance the possibilities that Packet Radio offers. Trevor Tugwell can be reached at 11 The Dell, Stevenage, Herts SG1 1PH.

Ray Berry GW6JJN

This series of articles is designed for radio and microcomputer enthusiasts alike. If you have any queries that you want answered, hints and tips to share or topics that you would like to see covered write to Ray Berry, Microradio, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

Open Forum

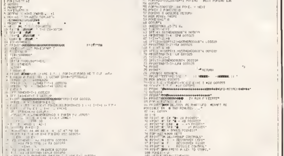
UFO Attack

on Vic 20

UFO Attack is an interesting game for the unexpanded Vic 20 the object of the game is to destroy as many of the UFOs as possible within the two minute time limit. You are in control of a destroyer based on earth and attack the UFOs with missiles

Program Notes

Lines 1 to 20 Set up variables
Lines 21 to 80 Main program loop
Lines 81 to 103 Instructions



UFO Attack
by M O Keele

Baud Walk

Price war

Well, the price battle over the modems as forecast has really set the database world alight. Enter Unicom the all singing, all-dancing modem for hobbyists at a neat £57, although don't forget that the software to operate it costs another £20.

Unicom reckoned that if other modem manufacturers claimed 2000 sales a month, then they must be making fat profits. Well, I would love to get hold of a Unicom — they've promised to send me one — so that I can see exactly what components are inside and how they've managed to build it for around £35, assuming the price isn't there because they love us baud walkers.

Unicom say they have only used existing components and the modem is assembled by a number of different companies in the UK. It revolves around the AMD 7910 chip which I happen to know costs £13 — if you order a million off! Whatever, it's got to be great news. Modems offering similar capabilities currently sell for around £125 plus.

Software for the BBC micro is coming first, followed apparently by Commodore 64 and Spectrum, although the Spectrum's lack of an RS232 port may inhibit matters. Apparently the Unicom is at the moment in for BT approval which takes anything from three to six months so I'm reserving my judgement until I've actually used it. Write to 20 Orange Street, London WC2 for more details.

Another sign of the times — the Prism VTX5000 modem which carries on board software for the Spectrum is now appearing in some places at only £69.95 having dropped from £99.95 and again from £79.95 in some stores. The modem is 1200/75 1200/1200 baud and has user-to-user software as well as Micronet 800/viewdata software. Call 01-253 2277 for details.

Robin Wilkinson

Baud Walk is a new weekly column with news on networking, databases, reviews of modems and software and points of contact for information.

Any readers with experience of networking are asked to send their experiences or news of services to Robin Wilkinson, Baud Walk, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

He can also be contacted on Prestel mailbox 819963727.

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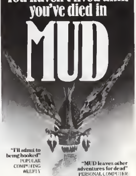
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Open Forum

Fred

on Vic 20

This is a two player game for the unexpanded Vic 20. The unlikely scenario, Fred has just seen Tron on video, and has got quite carried away. He has dug a trough around the living room and asked Edna (the wife) for a game of light cycles. Edna wasn't very pleased. Watch out for the deadly gas.

Controls: Edna — 'M' - left, '.' = right, ',' = down, ';' = up Fred — 'C' = right, 'X' = left, 'A' = up, 'Z' = down

Program	**Notes**
60-90	Draws border
150-240	Checks movement
250-350	Moves Edna and Fred
9000-9060	Messages

```
5 POKE36878 0
10 PRINT "J"
1, N=INT(RND(1)*255) M=INT(RND(1 *2
20 POKE36879,59 POKE650,255 POKE.c       1.
30 PF=7906 PE=.514
40 Y=-1 U=1
50 E=102 A=81 C=30720
60 FORI=0TO21 POKE7680+I,B POKE38400+I,6 NEXT
70 FORI=7701TO8185STEP22 POKEI 102 POKEI+C,6 NE T
80 FORI=8185TO8164STEP-1 POKEI,102 POKEI+C 6 NE T
90 FORI=8164TO7680STEP-22 POKEI,102 POKEI+C 6 NE T
95 POKEPF 81 POKEPF+C 2
100 POKEPE,81 POKEPE+C 4
150 GETF$ IFF$-  THEN250
155 IFF$="C THENY=1 GOTO250
160 IFF$="X"THENY=-1 GOTO250
170 IFF$="A"THENY=-22 GOTO250
180 IFF$="Z"THENY=22 GOTO250
210 IFF$="M' HENU=-1 GOTO255
220 IFF$='  THENU=1 GOTO255
230 IFF$=','THENU=22 GOTO255
240 IFF$=   THENU=-22
```

Book Ends

Book *The Amstrad CPC464 Explored* **Price** £7.95 **Micro** Amstrad **Supplier** Kuma Computers, 12 Horseshoe Park, Pangbourne, Berks.

All things considered there are few books on the Amstrad computer. Considering the mad rush to get QL books out, the Amstrad, which was well received and appears to be doing well, is shunned as though it has a social disease.

Kuma, who have been supporting the Amstrad with software, have now produced one of the first books for it. It is in the 'general guide' style covering simple programming in Basic and toying briefly with machine code.

There are five broad sections covering basic setting up, using music, graphics, assembly language and ending with the construction and analysis of a fairly substantial home accounting program. There are other programs throughout the book illustrating each new item.

The book is well written and thorough, although probably not as 'idiot level' as some other introductory books — no cartoon characters and colour diagrams here. Quite a good book but fairly expensive, too.

Graham Taylor

Book *Creative Computer Graphics* **Price** £15.95 **Micro** General **Supplier** Cambridge University Press, Publishing Division, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU

Now here's a book I'd like to see stuffed into my Christmas stocking — *Creative Computer Graphics* is a large format book chock full of illustrations of graphics created by computers.

The book aims to show just what is currently being achieved in computer graphics from films like *Tron* and the awesome-looking but as yet unfinished, *The Work* to commercial designs like the Channel Four logo.

It's a coffee table book really, rather than a serious educational tome — although the text surrounding the lavish illustrations is interesting if not deeply analytical. Personally, I love coffee table books and this one is one of the most flickable I've seen.

Some of the pictures I've not seen before and some of the graphics are astounding, although not the sort of thing your going to see on your home micro. Not that micros are completely ignored: there is a section towards the end of the book which covers games and mentions a few favourites like *Valhalla* and Commodore's *Soccer*. The choices are a bit random and some pictures which are evidently from Psion's QL packages are described as being on the Spectrum computer — nevertheless a brilliant Christmas present.

Graham Taylor

Book *Oric Atmos and Oric 1 Graphics and Machine Code Techniques* **Micro** Oric 1 and Atmos **Price** £7.95 **Supplier** McGraw Hill Book Company (UK), Shoppenhangers Road, Maidenhead, Berkshire.

To make full use of Geoff Phillips' book you will need to know not only what machine-code is but also have some idea how to manipulate all those numbers.

This is an introduction to the internal workings of the two Oric machines. Graphics, sound, Rom, keyboard reading and more are dealt with, and several routines to be used with Basic (such as a *Trace* utility) are listed.

My fear is that possibly the book contains too much for the sake of clarity and it lacks an index. However, for the Oric owner keen to use the machine to its full it is probably worth investigating.

John Minson

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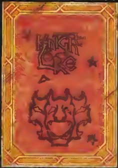
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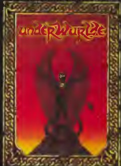
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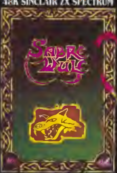
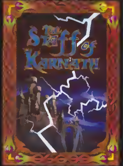
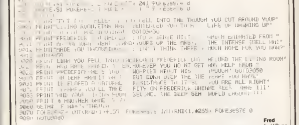


COMMODORE 64


The STAFF of KARNATH

"KNIGHT LORE", "UNDERWURLDE", "SABRE WULF", and "STAFF OF KARNATH" recommended retail price £9.95 inc VAT. Available from W.H.SMITH, BOOTS, J.MENZIES, WOOLWORTHS and all good software retail outlets. Also available from ULTIMATE PLAY THE GAME, The Green, Ashby de la Zouch, Leicestershire LE6 5JU (P&P are included) Tel: 0530 411485

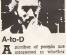
Open Forum



```
[illegible]
[illegible] HEN3050
[illegible] HEN4010
[illegible] HEN5000
[illegible]
[illegible] 241 POKE5355,4 0
[illegible] E.51 POKE[illegible] POKE[illegible] 6 0
[illegible]
[illegible] FELL INTO THE TROUGH YOU CUT AROUND YOUR'
[illegible] PRINT"LIVING ROOM.EDNA HAS [illegible] YOU TO A [illegible] LIFE OF WASHING UP"
[illegible] GOTO3050
[illegible] PRINT"FREDERICK [illegible] INTO A DENSE MIST [illegible] EMINATED FROM "
[illegible] THE INTENSE SMELL HAS"
901_ PRINT"MADE YOU UNCONSCIOUS [illegible] THINK THERE'S MUCH HOPE FOR YOU NOW?"
[illegible] GOTO9050
9020 PRINT"EDNA YOU FELL INTO THE TROUGH FREDERICK [illegible] AROUND THE LIVING ROOM"
[illegible] PRINT"AND HAS [illegible] ,HOWEVER YOU DO NT GET ANY HELP FROM "
902_ PRINT"FREDERICK-HE'S TOO [illegible] WORRIED ABOUT HIS [illegible] 'POUGH' GOTO9050
[illegible] PRINT"[illegible] BUT EDNA [illegible] THE TIME [illegible] YOU HAVE'
9031 PRINT"[illegible] ELAPSED A NATURAL [illegible] RESISTANCE TO IT SO [illegible] YOU ARE ALL RIGHT"
[illegible] PRINT"[illegible] YOU'LL TAKE [illegible] PITY ON FREDERICK WHEN HE SEES [illegible] III'
9033 PRINT"AND YOUR [illegible] ROOM BECOMES THE DEEP SEA [illegible] WORLD [illegible]
[illegible] PRINT"ANOTHER GAME [illegible]
9060 GETA$[illegible]A$="Y"THEN[illegible]
9070 POKE[illegible]INT(RND(1)*[illegible] POKE[illegible] INT(RND(1)*255) POKE53976 0
9080 GOTO9060
```

Fred
by H Dunn

The Music Box



A-to-D

A number of people are interested in whether you can interface an ordinary electric guitar with a computer. This is quite a tricky one and the answer applies to all instruments apart from those keyboards and drum machines equipped with MIDI standard interfaces or something similar — for which interfacing is easy.

A word of explanation is in order — MIDI is a serial interface (like the RS232 printer and peripheral interface) in which digital data is passed between synths or between a synth and a micro according to certain communication protocols set down by the synth manufacturers who introduced the system.

The important thing is that all MIDI data is *digital* — which is why it's available only for those instruments whose internal electronics is *already* digital. The computer in a MIDI system doesn't store sounds, but only the information required for a synth to produce them.

Unfortunately, most musical instruments (even the electronic ones) do not use digital data in the creation of their sounds. So in order to use a computer with them, their sounds have first to be digitised. This is done using a device known as an analogue-to-digital converter (or ADC) and regrettably, ADCs good enough for audio use are not cheap.

Now, the BBC Model B has a built-in ADC I hear you say, and so it has. But the BBC's ADC has a maximum sampling rate of 100 Hz (that's to say, it takes samples of the voltage being fed into it once every hundredth of a second — or, as the manual has it, once every 10 milliseconds). The result is returned in the BBC's *Adval* variable. Considering that the range of audible frequencies is roughly 30 to 15 KHz, the BBC's sampling rate is a mite slow!

The other popular computer with ADC facilities is the Commodore 64, whose SID chip contains a register returning digital values for an analogue signal on the *Pot X* and *Pot Y* inputs in the control ports. Like the BBC's ADC, that is intended for use with paddle or joystick controllers and is not good enough for direct conversion of audio.

If you want to experiment, however, the output of your guitar pick-up will need to be amplified. The BBC's ADC requires an input between 0 and 1.8 volts, while the 64's has to be between 0 and 5 volts. Suitable supply voltages for the necessary circuitry are available from the relevant sockets on each computer. It should be born in mind also that storing digital conversions can be very costly on memory.

One final point is that the Commodore allows you to treat audio output using the SID's digital filter. The input is on the Audio/Video Din socket on the back of the computer. The *Programmer's Reference Guide* gives all the necessary information on this facility and on the ADC.

Although A-to-D conversion is a problem, all is not lost. Several computers have peripherals available now at relatively low cost which allow you to sample-and-store sounds which can then be played using a keyboard.

Gary Herman

The Music Box is a new weekly column with news reviews and readers comments on all aspects of micros and music.

Any readers with experience of computer music making or companies with new product news are invited to write to drop a line explaining what they're doing to: Gary Herman, The Music Box, 12-13 Little Newport Street, London WC2R 3LD

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SPRITES			✦	✦
CARTRIDGE SLOT			✦	✦
MONITOR SOCKET		✦	✦	✦
BUILT-IN "BASIC"	✦	✦	✦	✦
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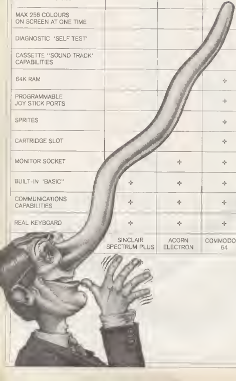
REAL KEYBOARD	✦	✦	✦	✦



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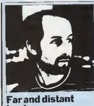

Far and distant lands

The airways of the world have been really busy this week with readers of The Corner in far and distant lands, eager for enlightenment.

First out of the bag was a letter from Malcolm Schmidt, of Kelvin in South Africa. He wrote to me some weeks ago about *Zork I* but has since solved the adventure. Thanks very much, Malcolm, for the detailed map on *Zork I* and *Planetfall*. I'm sorry that you haven't had much luck with The Corner, but please let me know about your experiences with *Enchanter*, which I'm sure you'll enjoy.

In the same post, The Grand Elf received a letter from Peter Craven of Blairgowrie, in the Transvaal, also in South Africa. Peter is a newcomer to our hobby and has just finished *The Hobbit*, with a score of 67.5, as well as *Inca Curse* and *Snowball*. As for *Planet of Death* — to get past the Forcefield (which, incidentally is the problem that gives *everybody* a hard time!), *Fire Laser* twice (very unfair this one, as there is really no clue at all) and then *Dance*, bearing in mind what you are hearing on the transistor.

You'll need the boots to wade into the lake (*Wear Boots Go Lake*). Here you'll find a coin, and you may need this if you're thrown into jail. The gloves you'll need to open the door to the computer room. In *Urban Upstart*, give just the Lager to the football fan — you'll need the fiver to get into the airport. The Small Key will, indeed, start the plane, but to fly it, you'll first need to learn *how* to! Try *Reading* the Book!

Peter also asks: "There must be other magazines worth buying that have adventure reviews and give help to lost travellers like me. Can you recommend any?" I certainly can, Peter: since The Grand Elf started the Adventure Corner some 18 months ago most computer magazines have a page devoted to this rapidly growing pastime. Most of them are pretty awful, but Keith Campbell's column in *Video and Computer Games Monthly* is one that I always read with great interest, as is the weekly page in *Personal Computer News*, written by the Gerrard Brothers and Bob Chappell among others.

I mention these in the cause of impartiality, as the one that I would recommend to you is our sister magazine, *Micro Adventurer* which, as its name suggests, is devoted to adventures.

A bit closer to home is Noordwijkerhout, in The Netherlands. This is where Mr P Woodhouse lives, and he writes asking for some advice in a couple of well loved adventures. "How do I pass the Troll without losing one of my treasures? And, in *Magic Mountain* (by Phipps Associates), how do I cross the Chasm?" To pass the Troll without paying, you must, first of all, acquire the *Golden Eggs* — then go to the SW side of the chasm. When you try to cross, the Troll will stop you, and you will then throw the Eggs to the Troll. To get back, you must have the Bear with you (make friends with him first!) and then throw him at the Troll. As for the Chasm in *Magic Mountain*, first of all, get the Stick, which can then be used to *Reach Rope*. With this, you can *Swing Across*.

Back now in Britain, Mr J Jenkins of Bicester writes: "My son is having trouble in an adventure called *Espionage Island*, by Artic Computing. His problem is getting past the first task, parachuting from the plane. From what I have observed in magazines such as yours, it would appear to be not so much the instruction but rather the way it is phrased."

Yes Mr Jenkins, this can be the most frustrating part of adventuring. Personally I think that the *puzzle* should be the difficult part of an adventure.

As to the problem. To get out of the Plane, first *Get Parachute*. Then *Wear Parachute*, *Pull Lever* (to open the door), *Pull Cord* and finally *Unstrap* (or *Drop*) *Parachute*.

Now, to the Beeb. Phil Rimmer has a Bee in his Beeb about this and says: "Please don't forget that the BBC users also enjoy adventure — let's have a few more BBC adventures on your page." I know, Phil, that Beeb-users are avid adventurers — they have some of the best available such as *Castle of Riddles*, which is one of the adventures giving Phil a problem. "How do I get out of the Black Maze?" Once in the Maze, *Wave* the Black Rod — this will give a puff of coloured smoke. If you move so that the smoke is coloured according to the colours of the rainbow.

Snowball

Level 9 Computing

Now to the adventure from Channel 8, *Escape from Pulsar 7*. Phil is stuck in the very opening: "I can't get out of the first three rooms — how many objects are hidden in these rooms?" This adventure starts off in a Social Room, in which is a couch. On the couch are a Note and Key, and moving the couch reveals a Rod.

Moveing objects in many adventures, particularly Channel 8's, will often uncover useful items. Proceeding South into a Cabin, *Close* the Door, which uncovers a Pillow on a Bunk. *Go* to the Bunk and move the Pillow thus finding another object — now return to the Social Room and *Go West* to the Bedroom. *Go* to the Bunk. *Examine Bunk* to find an air vent, which is your route to other parts of the adventure.

This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So, if you have an Adventure you want reviewed, or if you are stuck in an Adventure and cannot progress any further write to Tony Bridge, Adventure Corner, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD

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"I hate this game. I seem to be missing all my favourite TV shows" **ADAM BOWLES.** *(Poor old Adam)*

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Peek & Poke

Word processing

John Martin of Nicosia, Cyprus, writes.

Q **I am a regular reader of *PCW*, which is always available here in Cyprus, but at twice the UK price, and always look forward to your column.**

Could you please tell me which would be the best Wordprocessor program for my Spectrum 48K, as I want to use it with my printer for letter writing, etc. So far I've heard of only two *Spectext* and *Tasword II*, but I'm sure you'll know of many more.

A You don't mention if you have microdrives on your machine, if you don't have them and you are thinking of buying them at some point, then my advice would be to get the new *Wafadrive* from Robotronics, which enables the use of their excellent word processing program (probably the best I've seen on a Spectrum).

If that is too expensive then *Tasword II*, which I have used, is an extremely useful program, and at the price represents good value for money. I have not used *Spectext* myself, but have not heard of any major problems with it.

More ram

P Brown of Great Dunmow, Essex, writes

Q **Is there any reason why it would be impossible to increase the Ram of a 48K Spectrum by adding one of the advertised 32K add-on rampacks?**

A There is absolutely no reason why you cannot add an extra 32K to a 48K Spectrum. The problems start when you try and use the extra memory. The Z80 is only capable of addressing 64K of memory, ie, the 16K in Rom and the 48K in Ram. Without the use of some form of memory switching technique, any memory in addition to this 64K maximum is completely wasted.

Also, any software that you wrote to utilise the extra memory (were you able to use it) would not be really marketable, and would also require special *Loading* and *Saving* techniques. I suspect that by now you are beginning to appreciate why there has not been a flood of people buying these Ram extensions!

Program problem

Peter Hills of Bulls, New Zealand writes

Q **I am a Spectrum 48K owner having a problem with just one program — *Football Manager* by Addictive Games.**

All the other programs in my library give no trouble at all. But with *Football Manager*, right at the beginning before the first match highlights are played, it stops with a 'Nonsense in Basic Line 6560' error message.

I will mention at this point that the tape will load and play perfectly on my friend's Spectrum using my tape recorder or theirs.

Listing line 6560 shows that on my machine instead of having LET a(1) — etc, I get LET a(1 ?????) — etc. The spurious full stop and five question marks are impossible to remove. They can be edited out, but will reappear when the program is Run again. Do you have any thoughts on what is causing the problem?

A This is, unfortunately, quite a common problem with the Spectrum. It seems that certain cassette tapes will always cause trouble on a particular machine, whilst loading perfectly well on another.

In your case the solution to your problem is quite straightforward. The facility exists on *Football Manager* to *Save* a new version of the game, so as to continue your meteoric rise to First Division fame and glory. All you need to do is to Run the program, obtain the famous error, correct it and carry on playing until you get the opportunity to Save the game.

At that point you should save your current position (which also saves a new version of F M for you), on to a blank cassette.

If you find that you cannot get the program to restart, after correcting the error, try *Goto* 6560. That should solve everything. If my advice doesn't work, please write to me again, enclosing a listing (if possible) of the affected part of the program, so that I can check it with my version.

Screen load

N Blow of London writes.

Q **I am writing a program with a loading screen, and I want to save the whole thing; ie, loading screen plus main program. Could you tell me how to do this, so that it loads the screen, then the program and then runs?**

A There are many ways of achieving what you want; the easiest is the use of a Loader program. An example is show below. The main idea behind the loader program is to control the loading of all other software into the computer for one program. For instance, a program which requires a loading screen, a main Basic program, and a set of machine code subroutines. On machines like the CBM 64 this technique is called Bootstrapping. The loader program example I have given is for the Spectrum.

```
10 REM Loader Program
20 CLS: BORDER 4: REM clear screen and set border colour
30 LOAD "" SCREEN$:REM load screen
40 LOAD "" REM load main BASIC program
```

The main Basic program is saved so as to auto run, by using the *Save "fred" Line* start line, format of the Spectrum *Save* command.

Array sum

J Holmes of Glasgow, writes

Q **Can you help me with a CBM 64 Basic problem?**

```
10 DIM S(12):DIM TP(12)
20 FOR T = 1 to 12
30 ?CHR$(147)
40 INPUT "Salary for month";S(T)
50 INPUT "Tax paid this month";TP(T)
60 NEXT T
```

How do I find the sum of all the TP and S arrays? Do I have to do:

AS = S(1) + S(2) + S(3) + S(4) + S(5) + S(6) + S(7) + S(8) + S(9) + S(10) + S(11) + S(12) etc, or is there another way?

A This following gives you the sum of both arrays (in AS and AT), which you could then print at the end of your *For* loop.

```
10 AS = O:AT = O
45 AS = AS+S(T)
55 AT = AT+TP(T)
```

Pools prog

P Edwards of Mid Glamorgan, writes

Q **Please would you let me know whether it is worth doing the pools from a computer, as I have a program and the most score draws it will find is between four and five a week. As I own a CBM 64 your comments would be most welcome.**

A I used to do the pools regularly, and my weekly score draw average was between 0 and three, so your program easily beats me. Seriously though, with something as random as score draw selection, a computer is not going to be a great help.

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APPLE II 48k with manual Single Disk Drive + silent YRE Apple Printers + TV + video output hardly used £679 ono. Tel Worthing 200118 after 6pm

ITT APPLE 48K computer Basic in Rom, Colour Disk Drive + Penelta Printer card, Roms, Apple s/w with Apple Writer. L/C etc £320. Part Exchange Dragon 64. Tel Ted 01 675 2959 (day)

Wanted

ACORN ELECTRON owners! I will pay you up to £6 for your original software and BBC software. Tel Cardiff (0222) 643587 for details. After 6pm. Ask for Jason

SPECTRUM 48K AND loads of software, books, mags, programmable joystick. Swap for disc drive and the DFS for the BBC micro. Might sell phone 04868 6585 after 4.30pm

ESPRESS SAILING dinghy with trailer sails + safety equipment. Valued at £800. Swap for £400 of used computer equipment. Tel 01 550 3564 anytime

SWAP VIC 20 starter pack plus games + books or unique 40 channel CB with extras for Spectrum 48K with extras. East Horsley (Surrey) 4205

MICRONET PRESTEL for BBC 1.2. Acoustic coupler + s/w and all leads £45. 01 684 6574

SPECTRUM 16K, in need of repair + £70 of s/w all originals. For Atari 400 with Basic or Texas TI99/4A with Super Expander. Tel 01 531 1930

WANTED BROKEN SPECTRUM for spares experiments. Up to £20. Also ZX80 Rom disassembly and any interface 2 cartridges. Tel Peter 051 830 2450 eves

WANTED ZX81 to write / swap tips etc. Tel Mark 0524 52920 for details.

£80 OF ORIGINAL Spectrum s/w to exchange for Microspeech. Tel 01 809 2841

COMMODORE HIGH FLYER Business game urgently wanted on tape, ring Jim on 0902 893084. Anytime

SWAP ELECTRONIC NANO held Space Invader game for Atari 800 XL software or Pole Position cartridge. Write to Dean (PCW) 268 Brooklands Road Manchester M23 9HD

SWAP 40 CHANNEL CB radio + power supply + SWR + aerial and hand held CB for your CBM 64. Write to Dean (PCW) 268 Brooklands Road Manchester M23 9HD

BASIC COMPILER WANTED urgently for Oric 48K. Willing to pay high price. Phone (0742) 304316 or write to John Hayes 24 Whitworth Road, Crosspool Sheffield S10

WANTED 48K SPECTRUM + real keyboard. No software paid 90£ cash + postage or 70£ + 20£ for separate units

WANTED AMSTRAD concise Basic + Concise Firmware manuals. Software especially Devpac Zen Pascal also required. Phone 0422 75365

WANTED ORIC 1 48K without s/w except utilities e assembler etc. Price up to £60 one. Write N Sandisin 27 Dorset Road Merton Park London SW19 3EY. Local if poss.

WANTED AQUARIUS information tape recorder input output details printer interface details any information circuits most welcome. Norman Waghorn 39 Cumberland Ave Broadstairs Kent

WANTED REEL TO REEL tape recorder for 48K Spectrum + tapes send details of age, make, etc to Derek Scott 260 Harden Place Hawick, Roxburghshire Scotland TD9 7BY

WANTED ZX PRINTER will pay £10. Wanted joystick will pay £4. Wanted ZX microdrive and interface 1 will pay £25. Telephone Bristol (0272) 595167

BBC B WITH Disk Drive and Printer. Swap for Nikon F3 with 28mm 3.5 lens. Also 80-200 300m 4.5 also Folding Camera bag as new. Total £1 000. Tel Mr Warner 01 528 5071

WANTED BBC B in good working order for approx £200. Cash collection may be possible if in West Midlands. Tel (0203) 303784

WANTED 16/48K SPECTRUM Will swap for Vic 20 + C2N + Software including Arcadia, Vegas J'pot etc + cash (£10). Tel Chris on Burgh Heath (07373) 55581 or write Ellsworth Oaklands Rd Burgh Heath Tadworth Surrey KT20 6BS

WANTED Q-SAVE or other fastload save program for ZX81. Tel (0602) 389063 after 5pm

WANTED MICROVITEC QL Monitor and Qume printer. Tel Mendlesham 7130

WILL SWAP MY ATARI 410 Tape recorder for a 1010 tape recorder plus £5.00 perfect condition boxed. Phone Wigan 53938 after 5pm

WANTED DISK DRIVE for CBM/PET computer. Dual or single drive required e.g. 2040 3040 4040 etc. Working model preferred but anything considered. Tel Chester 675717

SWAP CLASSICAL GUITAR Alhambra model 5c and carrying case for Commodore 64 with extras or BBC Model B with cash adjustment etc. Evenings 01 363 3363

SPECTRUM PEN PALS wanted all over the world. Girls + boys. Letters assured to all those who write. Colin Edwards, 33 Arodene Road London SW2 2BQ England

WANTED BBC Model B. Swap CBM 64 + C2N + 1520 Printer all under guarantee + book + joystick + software inc Beach head Colossus Chess F/Panel Hbook Hunchback worth over £450 + other software + mags. Mike phone Cardiff 594846

WANTED OLD MICROS Jupiter Ace sinclair MK14 UK101 ZX80 etc etc. I won't make you rich but I will give your loved ones a good home. Phone 01 450 0214

WANTED CBM 64 with recorder. Offers to Matthew. Phone 01-590 7980 after 6 pm

SEIKOSHA GP 100 AS swap for parallel printer or BBC Roms. Tel 01 241 2594

BBC OR ELECTRON computer wanted! Also accessories. Must deliver. Tel Sunderland 40856

SWAP SUZUKI X7 250 cc motor cycle 10 months m o t, x/reg, faired top box good condition. Tel 01 598 9065 for a Amstrad CPC 464 or CBM 64 + Disk drive Spectrum pws + w h y

WANTED ZX81 out of order and keyboard not working. Tel John 021 551 8427

WANTED WORD PROCESSOR + other business and educational programs for ZX Spectrum. Good price paid. Write to Mr Alan 28 Lansdown Road 7 Kings Ilford, Essex IG3 8NE

WANTED CMB 64 + cassette recorder, will swap for 48k spectrum with joystick + Kempston interface. Tel 0642 484785 after 5 pm.

WANTED NON-WORKING COMPUTER prefer CBM64. Consider anything. Condition unimportant, must be cheap. Tel Nick Basildon 417861

WANTED EPSON HX 20 with Acoustic coupler + communications software. Ask for Gary. Tel 0842 57423 before 5pm

SWAP PRISM MODEM for graphics rom for Beeb. Braithwaite 441

I WILL SWAP MY SPECTRUM Currah Microspeech with Currah Dictionary for a ZX printer with paper. Contact Leeds 620206 ask for Paul (after 4 pm)

WANTED MODEM to fit Dragon 64 RS232 socket acoustic or other type. Please ring with price and details 0422 247456. If wanted have darkroom equipment colour black/white to swap

MICRODRIVE AND INTERFACE wanted. Furthermore has anyone out there got an OCP Assembler or M/C Toolkit? Phone Eric on Portsmouth (0705) 370558

SWAP PHILIPS V2000 Portable video system 8 hour tape 4 months old best offer or Spectrum 48k + extras or sell for £250. Tel Macclesfield 21571

WANTED M/C PROGRAMMER to convert Spectrum program currently on market to Amstrad Vic20 etc 45% of retail and mail sales paid. Write to S Johnson 78 Naim Street, Crookes Sheffield S10 1UN

WANTED TI-99/4A Expansion system box RS232 32k disc TI compatible printer minimemory parsec and any other interesting modules. Tel Peterborough (0733) 424642 evenings

SWAP OR P/EX Suzuki X7 250cc M/cycle 10 month m o t tax, T/box rack x-reg g/cond for D drive printer monitor suitable for Lynx or cash. Phone Hugh 01 598 9065 eve

SWAP YOUR BBC B for my Suzuki X7 250cc m cycle 10 months m o t tax t/box rack, x reg g/cond plus Lynx 96k plus software and books. Phone Hugh 01 598 9065 eve

SHARP STEREO music center for sale SG 170EW 72W turntable radio and cassette (with metal) plus speakers, sell £85 or swap for BBC printer or Graftpad. Tel 06831 6887 (Surrey)

For Sale

MODEM FOR SINCLAIR SPECTRUM Prism 500 + Brand new + instructions £50. Knutfield Ridge 2348

BUSINESS S/W FOR SPECTRUM Betasoft Professional bought sales ledger petty cash ledger VAT calculator £50. Tel 01-504 8334 (evenings only)

AMSTRAD COMPUTER Monochrome monitor £70 of S/W 1 Joystick. Swap for latest version of QL. Tel 01-337 4565

TI994A MINI MEM PRK extended Basic Pascal plus other modules joysticks. Today's price £400. Offers 0339 21647 (Essex)

DUAL BEAM OSCILLOSCOPE. S E Labs SM 111 15MHZ bandwidth complete with two probe lets. Excellent working order. Wanted Dragon disk drives plus DOS or Delta drives plus DOS. Tel 07368 50478

TEXAS TI99/4A JOYSTICKS pair as new unused £12. Spectrum programs Ground Attack, Escape, Sound FX, Monster Mine, Autokopy £2 each. Wanted Phoenix Painter (A & F) Omnicalc II. Tel Southampton (0703) 865086

BROTHER EP22 printer typewriter RS232C interface 75/300 Baud. As new boxed with paper and ribbons. Cost £170 sell for £100. Will send c o d in UK. Phone Stevenage (0438) 723058

TI994A + EXT Basic + Mini Mem + manuals + cassette lead + Invaders + prog basic with TI + graphics and bar chart tapes + one year TI mags £145. Tel (0685) 877909 after 6pm

ZX SPECTRUM with free game £20 ono VGC. Contact R Gower 4 Clyfach Crescent Newport Gwent

QL PRINTER Seikosha GP 250X serial and parallel interface 50cps dot matrix printer with graphics capability as new in box £175. Tel 01-773 0495 evenings

ZX interface 1 c/w RS232 printer lead. Virtually new. Cost £65 bargain £45 plus postage. Tel (0073) 82051 evenings

TEXAS TI-99 plus games worth £150 will sell for £75 ono. Make excellent Christmas present. Tel Ramon or Steve on 061 205 5991 between nine to five weekdays

DOWNSWAY programmable joystick for sale with interface (Spectrum) £15.00. Phone 01-654 0053 evenings.

SHARP MZ700 with integral cassette plus two basics, 13 games compiler and catalogues etc. As new boxed and guaranteed £135. Tel Melksham 0225 704030

DEUS EX MACHINA by Automata. Unwanted competition prize. Only £10. Worth £15. Phone Greg on (0625) 675475 after 6 p m

KADA high res green screen monitor little used £85. W H Smith data recorder new £28. Macclesfield 612502.

MUST SELL Sharp MZ700 with built-in printer plotter cassette plus Pascal E Assembler 4 Basics and other software including games £190 worth £420. Tel 0742 471190

ZX MICRODRIVE, boxed, brand new unused. Full guarantee £35. Tel 0625 877 496

COMPUTER SWAP

Computer Swap entries are limited to 30 words. Either fill in the accompanying form and send to Computer Swap, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD or telephone 01-437 4343

All software offered through computer swap must be in original condition and for private sale only.

It cannot be swapped.

Warning. It is illegal to advertise pirated software.

COMPUTER SWAP

Please write your copy in capital letters on the lines below

Name ____________________

Address ____________________

____

Telephone ____________________

ALPHA COM 32 printer for Spectrum or ZX81 6 months old Very good condition £45 Tel South Hokenden (0708) 857010

TEXAS TI99-4A s/w Extended basic (new) £60 Various models from £5 to £14 Inc. Blasto Car wars Chess Munchman Pacsec Tel 01 992 4548

BURROUGHS B80 mini-computer 2×8" drives 2×2 3 megabyte drives 1 +30 2 3MB cartridges. Fully operational includes payroll ledgers account preparation labelling Cobol Compiler Disk cleaner Suit business or enthusiast £700 ono Tel Mark Rine (0804) 25045

PLOTTER-PRINTER for TRS-80 and printer interface cable Paper width 9" 75 characters across £99 ono Tel Weybridge 57442.

BROTHER HR 15 professional electronic daisywheel typewriter & printer centronics interface comes complete with keyboard 3 daisywheels and error correction ribbons worth £600 Accept only £500 ono Tel Andrew on 0625 614157

SINCLAIR ZX microdrive and interface one three cartridges and utility cassette Complete with manual etc Only £90 Tel Norwich (0603) 400120 ext for Terry

VIDEO GENIE EG3003 + books + 24 flite programmable interface 8255 kit and suitable for comms Tel 0535 44587 (Keighley)

ORIC 48K for sale excellent condition Over £100 worth of original s/w Would make excellent Xmas present. Tel 01-540 7860 for details

16K COLOUR Genie with manual + tape recorder £65 ono Tel Rhyl 0745 55421 after 6 p m

ORIC 1 Black & White TV cassette recorder £40 of s/w £55 of books 10 editions of Oric owner mags Open to offers. Tel 01-989 5364

NEC 8001 business computer 24K microsoft basic 32K RAM RGB hi-res monitor 80×25 7 colour display CP/M compatible w printer cost £860 Bargain £500 or Dragon 64 + cash Tel 01-673 7877 evenings only

PRINTER FOR SALE. Centronics 779 parallel interface 3mm cable Offers. Dave — Hornchurch 49642.

ORIC MICRODRIVE 82A Printer Dot Matrix 120 CPS Block graphics. Parallel + serial interface Complete with leads £150 ono Tel 0296 86080

EPSOM TX80, 120 CPS Dot matrix Printer + 3 new Ribbons Simple good quality printer connects to most micros £150 ono Tel Ashbourne 70645

2 MICRODRIVES ZX interface I complete compatible cassette £200 of original s/w Death Pack, Hobbit, Scorpio One Kong £200 ono Tel 01 992 1362

STAR GEMINI 10X printer for rush Uses all Epson codes friction + tractor + single sheet PWO £165 Tel Leeds 792796

OLIVETTI DISK DRIVE suit BBC Tandy Video Genie etc Good working order £75 ono Tel 08324 331

DOT MATRIX printer Cosmos 80 two months old as new 80 CPS 80/142 columns £165 Telephone Hornchurch 55753 or work 01-594 3495 David Cole

ATMOS 48K WITH software and books Mint condition still under guarantee Great value at £85 ono Tel 0763 72928

UNWANTED GIFT Telemod 2 modem compatible with BBC + C-64 no interface bought for £80 sell for £70 ono Tel Gt Yarmouth (0493) 602977 Between 6pm and 8pm

48K LYNX, in original condition with leads, intro tape manual and user mags £86 ono Phone Hayes (Middx) 01 361 4593

FOR SALE TRS-80 Model 1 48K double density two disk drives printer + paper software manuals + leads £600 ono Tel (0905) 3553800 evenings Worcester

"THE TIME MACHINE" by Channel Eight cost £5 50 Tel Byfleet 47415 4pm 9pm or write to 46 Woodlands Avenue West Byfleet, Weybridge Surrey KT14 6AP

SHARP MZ 700 + TV monitor + data recorder + Space Invaders + Pac Man + Scramble and mailing list and more Only 8 months old sell for just £200 Tel 061-486 9601

CUMANA 100K Disc Drive for BBC four months old hardly used With cables utility disc and manual Excellent condition only £90 Tel Chertsey (09328) 62124

SINCLAIR QL (latest version) with printer and monitor cables £380 Tel Aileen Fareham 892533

ORIC ATMOS 48K excellent condition + £70 worth s/w books four Oric owner mags two cassette leads £150 ono Write or call at 82 Almond Avenue Kidlington Oxford, OX5 1EW Phone (0867) 54864

PHILIPS G7000 Video game with eleven games worth £2000 Will swap for Spectrum 48K games or Equipment or will sell for £90 Tel 061-464 440

S/W FOR 48K Lynk Inc. level 9 Colossal Adventure snowball Golf Muncher Numerune Wilkin Soft games Volume I £85 the lot. All original Tel (0728) 747348

TI/994A vgc with cassette leads, joystick interface books + tapes £70 ono Tel 0580 782698

SHARP PC 145 manual, boxed lyes guaranteed For a ZX81 or sell Tel 01-804 3229

MUST SELL SHARP MZ700 computer with built-in 4-colour printer plotter and cassette plus Pascal M-code 4-basics asm ED/ASS and other software Any offers considered Tel (0742) 471160 after 6 30pm

MODEL RAILWAY layout N gauge 180ft track, 3 controllers, 6 locos. coaches rolling stock all unused value approx £370 Swap for computer or Commodore monitor Phone (0385) 273143

PHOTO-COPIER for sale 3m Scotch Copier Perfect working order Accept £35 or swap for ZX81 etc. (0224) 875717

TELETEXT ADAPTOR for BBC £160ono Tel 01 868 3092

INTELLIVISION TV game with voice cartridge + 2 games £50 Spectrum 48k with 6 tapes (games) £85 Atari VCS s/w + missile command etc £75 Tel 01-519 3674

CURRAN MICRO SPEECH for ZX Spectrum Excellent condition Bargain at £18 Also "Sherlock" as new with manual for £7 and "Psytron" for £3 Tel (0909) 477189 after 6 pm

SANYO MBC 665 monochrome monitor Only £900 inc. of vat + s/w eg word star data star etc. Tel Wigan (0942) 47423 before 5 pm Gary or Dave

AQUARIUS + data recorder £50 Tel 061 308 4953

14 MICRODRIVE Cartridges £3 00 each Tel 01-458 8461 (eve) Peter

FULLER FPS Spectrum keyboard £35 00 inc postage Tel Welwyn Garden 24244

NEW BRAIN MODEL A £90 ono also Zenith mono monitor (cost £110) £80 ono will sell separately or together £150 Tel 01 658 1782 (London SE3)

MEMOTECH MTX512 64 rarely used new last Christmas £315 inc 4 games manual etc Accept £175 Tel Ruislip 77662

SHARP MZ 80 A £175 Tel Sheffield 872819

ZX PRINTER C/W 4 rolls paper & p s u still boxed ZX81 Spectrum basic course book £4 00 ZX 81 NEC £2.00 Tel 01 853 8102

LNYX 48K for sale as new with manual leads and some software £140 Tel 01-699 9185 SE London

APPLE II 54k Rampack 280 CP/M pack pal encoder + disk drive £550 64 Park House, Seven Sisters Road London N4

FOR SALE Fuller FDB keyboard kit Spectrum £30 Currah micro speech £20 Phone 958 3788 after 4 pm

VIDEO GENIE EG3003 with built in cassette comes with manuals books (incl Capt 80 Adventure) and programs £90 + carr Phone Phil (0892) 818475 after 6 pm

PERSONAL RECORDS module for TI99 41A computer Tel Downland 53157 (Croydon) eve

CUMANA DISK DRIVE 40 track half height sell £110 ono or swap for Pioneer car radio cassette player (auto reverse and digital tuning) Tel 08633 6587 (Surrey)

RGB COLOUR 14" Microvitec monitor Apple compatible with case to match resolution 653(H) x585(V) excellent condition (still in original packaging) only £200 ono Tel (0203) 303784

SHARP MZ 700 cassette printer plotter pen sets rolls paper software games utilities books £275 o n o William Nagle 19 Menzie Road Glasgow G53 5JG Tel 041 883 0521

AMSTRAD CPC 464 colour computer including educational and game software only few months old items in original packing only £187 Excellent condition Phone Cy on 0279 28688 between 6–9 pm only

SANYO DR101 cassette recorder good working order sale for £20 or swap for BBC software Tel 01-304 3959

ADVENTURE HELPLINE

Nosferatu on Vic20 I have a decomposing corpse, an old witch, a man-eating shark and a dark tunnel — help!! Tom Liversage 43 Gallus Square Ferrier Estate Kidbrooke, London SE3 9NB (Tel 01 318 2190)

Twin Kingdom Valley on BBC Can anyone help in the later stages of this adventure? Richard Ankers 56 Ettington Close, Wellesbourne Warwickshire CU35 9RJ

The Hulk on Spectrum. How do I get the big gem? And how do I block the gas outlet? Stephen Fitzgerald, 10 Highfield Drive Ickenham, Middx.

Mountains of Ket on Spectrum. How do I get past the skull and the dragon? I Musgrove, 53 Lower Village Road, Sunninghill Ascot Berks SL5 7AF

Denis Through the Drinking Glass on Spectrum. How do you get out of Number 10? Stephen Barnett, 48 Linton Walk Brookvale Village, Erdington, Birmingham B23 7YJ

Pub Quest on Commodore 64. I cannot cross the road that is in front of the pub? How do you open the cupboard in the toilet? David Bates 7 Danelaw great Lumley Chester-le-Street, Co Durham, DH3 4LU

Voodoo Castle on Vic20 I cannot get through the crack in the wall. Conal Wright 120 King George's Avenue Leuscon, Suffolk, IP16 4JJ

Snowball on Spectrum. I need help! John Rundle 26 Western Road Aldershot Hants GU11 3PL.

Valhalla on Spectrum. I don't understand the third clue that helps you find Skornir. D Leech, 12 Hillcrest Halton Brook, Runcorn, Cheshire

The Count on Vic20 How do I get to the tomb and what use is the lens set in the oven Michael Turpin, 115 Meadway Hodderdon, Herts

Hobbit on Spectrum. After collecting the ring where should I go? How do you escape the goblin's dungeon? David McCall, 20 Manse Crescent Stanley Perth, Scotland

Calixto Island/Shinanigans on Dragon. How do I get to Calixto Island? Shenanigans — how do I get into the air-way? Paul Mitchell, 14 Honeybrook, Waltham Abbey Essex EN9 3DD

Velnor's Lair on Spectrum. Velnor always kills me with a bolt of lightening (I am a warrior) P Sellick, 1 Evenglade Park, Abingdon, Oxon OX14 3SZ.

Four Gates to Freedom on Vic20. What is the code to open the large metal door with the code-input panel? Raymond Kirk, Flat 1 108 The High Street Norton, Stockton-on Tees Cleveland.

Valhalla on Spectrum. All I can do is map adventure land. How do you start the quest? Penny Webber 23 Osprey Park, Thornbury, Bristol, Avon.

Hobbit on Spectrum. How do you get out of the goblin's dungeon? How do you read the map? R Smith, 17 Kirton Close Mansfield, Notts

Hobbit on Spectrum. What do you do after opening the window to the goblin's dungeon? JA Saunders, 141 Lent Rise Road, Burnham, Bucks SL1 7RN

Valhalla on Spectrum. I can't find Drapnir Who is my weak friend? K Norton, 6 Devonshire Close, Staveley, Chesterfield.

Ship of Doom on Spectrum. How do you get the key out from the glass cover? How do you get the body out of the ice block? Mr Hughes 131 Holme Lacy Road, Putson, Hereford, HR2 6DG

Snowball on BBC I cannot find the combination to the door in the pink and green security alcove. Also how do you use the screen? Mark Neale, West Kell House, Station Road, Patrington HU12 0NE

Dark Dungeons on Vic20 What does the magic scroll say when it is decoded? Anthony Cottman, 42 Carlton Avenue Kenton, Middx.

Golden Baton on Spectrum. I can't get into the caves under the hut (I can't find a light) I have got the rag and matches. Stephen Manchester 32 Watt Street, Southcoates Lane, Hull, N Humberside HU9 3RJ

Knight's Quest on Spectrum. I cannot find the poppy to open the door Craig Waddell, 14 Jarvie Place, Glenrothes, Fife, Scotland.

Top 10

Dragon 32

1	(1)	Hunchback	Ocean
2	(3)	Hungry Horace	Melbourne House
3	(—)	Mystery of the Java Star	Shards Software
4	(9)	Chuckie Egg	A&F
5	(5)	Cuthbert in Space	Microdeal
6	(4)	Mr Dig	Microdeal
7	(8)	Kriegspiel	Beyond
8	(7)	Dragon Chess	Oasis Software
9	(5)	The King	Microdeal
10	(10)	Bug Diver	Mastertronic

Atari

1	(1)	Revenge of the Mutant Camels	Llamasoft
2	(3)	Computer War	Atari
3	(4)	Zaxxon	Centresoft
4	(4)	Star Commander	Creative Sparks
5	(9)	Tank Commander	Creative Sparks
6	(8)	Caverns of Mars	Atari
7	(6)	[illegible]	Imagine
8	(2)	Gridrunner	Llamasoft
9	(—)	[illegible]	Ex Inc
10	(10)	Slinky	Centresoft

Spectrum

1	(1)	Daley Thompson's Decathlon	(Ocean)
2	(2)	Beachhead	(US Gold)
3	(4)	Kokotoni Wilf	(Elite)
4	(10)	Underwurlde	(Ultimate)
5	(6)	Avalon	(Hewson)
6	(3)	Danger Mouse in Trouble	(Creative Sparks)
7	(—)	Pyjamarama	(Microgen)
8	(7)	Tornado Low Level	(Vortex)
9	(8)	Deus Ex Machina	(Automata)
10	(—)	Turmoil	(Bug Byte)

(Figures supplied by W H Smith)

Vic 20

1	(—)	Wizard and the Princess	Melbourne House
2	(2)	[illegible]	Mastertronic
3	(1)	Computer War	Creative Sparks
4	(6)	Blitz	Anirog
5	(—)	Sub Commander	Creative Sparks
6	(—)	Tower of Evil	Creative Sparks
7	(10)	Star Hunt	Mastertronic
8	(5)	Snooker	Visions
9	(—)	Space Scramble	Mastertronic
10	(—)	The Perils of Willy	Software Projects

Commodore 64

1	(—)	Fighter Pilot	Digital Integration
2	(—)	PC Fuzz	Anirog
3	(—)	Hampstead	Melbourne House
4	(10)	Chess	Leisure Genius
5	(8)	Chiller	Mastertronic
6	(—)	Beachhead	Centresoft
7	(—)	Scrabble	Leisure Genius
8	(1)	International Soccer	Commodore
9	(—)	Bruce Lee	Centresoft
10	( )	River Raid	Activision

Amstrad

1	(2)	Harrier Attack	Durrell
2	(4)	Code Name Mat	Micromega
3	(7)	Chess	Amsoft
4	(8)	Roland in the Caves	Amsoft
5	(9)	Star Commando	Terminal
6	(6)	[illegible]	Abersoft
7	(3)	Monster Chase	Romik
8	(5)	Admiral Graf Spey	Temptation
9	(8)	Roland goes Digging	Amsoft
10	(—)	Electro Freddy	Amsoft

BBC

1	(1)	Elite	(Acornsoft)
2	(2)	Jet Pac	(Ultimate)
3	(3)	Mr Ee	(Micro Power)
4	(6)	Frak	(Aardvark)
5	(7)	Micro Olympics	(Database)
6	( )	3D Grand Prix	(Software Invasion)
7	(6)	Aviator	(Acornsoft)
8	(—)	Eddie Kidd Jump Challenge	(Software Communications)
9	(10)	Erik the Viking	(Mosaic)
10	(8)	Wallaby	(Superior)

(Figures supplied by W H Smith)

NEW!

Readers' Chart

Vote each week for your favourite titles

Win £50 each week

Each week *Popular* will compile its own special software top ten chart — compiled by YOU

All you have to do to vote for your current three favourite software titles is to fill in the form below (or copy it out on to another sheet if you don't want to damage your magazine) and send it off to Top 10, *Popular Computing Weekly* 12-13 Little Newport Street, London.

To add a bit of spice we will be sending a £50 prize each week to the person who correctly selects that week's top three. If no-one gets it right the £50 will be added to the following week's chart and so on until someone gets it right! (If there is more than one winner that week's prize — whatever the 'pot' stands at — will be split equally between all the correct entries.)

Entries are now being acepted for Week 2. The chart fund stands at £50. Voting for Week 2 closes at 2pm on Wednesday November 28.

Name..

Address..

....

....

My top 3: Voting Week 2

1..

2..

3..

Diary

Event	Dates	Venue	Admission	Organisers
Compec 84	Nov 13-15 10.00am-6.00pm Nov 16 10.00am-4.30pm	Olympia	£3.00	Reed Exhibitions 01-643 8040
6809 Colour Show for Dragon and Tandy Users	Nov 17-18 10.00am-6.00pm	Royal Horticultural Hall London SW1	£2.00 adults £1.00 children	Computer Marketplace 01-930 1612
Christmas ZX Microfair	Nov 17 10.00am-6.00pm Nov 18 10.00am-1.00pm	Alexandra Palace London N22	£1.50 adults £1.00 children	Mike Johnston 01-801 9172
Humberside Computer Fair	Nov 19 11.00am-5.30pm	Winter Gardens Cleethorpes	50p (accompanied children 25p)	Grimsby Computer Club 0472 [illegible]
Computer Auction	Nov 20 6.00pm	Bloomsbury Hotel Southampton Row London WC2	Free	Cracker Computer Auctions 01-373 [illegible]
Electron and BBC MicroUser Show	Dec 6-9	New Horticultural Halls London SW1	£3.00 adults £2.00 children	Database Publications 061-456 8383

New Releases

RUNE FOR MORE

Sometime last year, around a month or so before *Valhalla* was finally issued Dorcas issued a program called *Oracles Cave* which featured an animated man who walked around, climbed ropes fought baddies and hunted for treasures, in some ways the first animated graphics adventure

THE
Runes
of
Zendos

Dorcas has now released a sequel to *Oracles Cave* entitled *The Runes of Zendos* which features the same general layout and a similar, although smaller character

The plot is complex and has been deliberately designed to function on different levels — on one it is a bash it out dungeons and dragons variant, on another it has a text adventure in which amongst other things you try to discover the meaning of various secret runes

Here's the plot. The year has been trapped — the spirit of each month is hidden in 12 Runic Hour Glasses which are scattered deep within a magical castle You must find each glass and attempt to decipher the runes around it.

Top half on the screen shows the action — the little man who walks, runs, fights and climbs The bottom is for you to input your sentence and for other information. There are a lot of options within the game including saving to microdrive The 12 glasses form 12 connected, but separately playable adventures, and you can switch to other adventures at any time during any game

Graphically it's fair but not to be compared with the likes of *Tir Na Nog*; nevertheless it's tremendously playable and should take ages to solve completely

Program *The Runes of Zendos*
Price *£7 95*
Micro *Spectrum*
Supplier *Dorcas*
3 The Oasis
Glenfield
Leicester

NOT STUPID

Castle Blackstar is the latest release from CDS Micro Systems and is unusually for the company an adventure Plotwise what we have portrayed here is woman as powerful (and beautiful) force of good rather than woman as helpless (but beautiful) captive in the hands of evil.

CDS Micro Systems
CASTLE BLACKSTAR

Lady Arienus is a goodie she has hair like spun silver, is tall and willowy, and she has lost her power orb Guess what you have to do

First impressions of this adventure are good, it has a pleasing BBC like character set and has been very thoughtfully planned. The mark of a clever adventure is when it responds to incorrect inputs (ie wrong guesses) intelligently For example, when stuck in the woods I first tried jumping to which it said after jumping up and down for a while you are forced, breathlessly, to stop', then I tried to climb a tree, basically I was told not to bother Such things for addictiveness make such a relief — it didn't say 'you jump'

If you want a quality text adventure that won't irritate you with stupid responses, you'll enjoy this.

Program *Castle Blackstar*
Price *£9 95*
Micro *Spectrum*
Supplier *CDS Micro Systems*
Silver House
Silver Street
Doncaster
South Yorkshire

HACKABLE

Software Projects have, in *Lode Runner* provided a game which is designed to be hackable You are positively encouraged to redesign layouts, baddies and just about everything in *Lode Runner*. Without redesign what you get is a pretty unexciting version of *Apple Panic* run along platforms climb ladders collect blobs

However, it's easy to design your own screen layouts of platforms and ladders, placing baddies and goodies wherever you want Thus rather like all those *Manic Miner* redesigners you can make the thing as easy or difficult as you want.

Program *Lode Runner*
Price *£9 95*
Micro *Spectrum*
Supplier *Software Projects*
Bear Brand Complex
Allerton Road
Woolton
Liverpool

LODE
RUNNER

This Week

Maths Plus	Ed	Commodore 64	£6.95	Scisoft
Science	Ed	Commodore 64	£8 95	Scisoft
Time Trucker	Ed	Commodore 64	£7.95	ASK
World Geography	Ed	Commodore 64	£7 95	Superior Soft
Arcadia	Arc	Dragon 32	£5.50	Beau-Jolly
Number Painter	Ed	Electron	£8 95	ASK
Frogger	Arc	Jupiter Ace	£4 95	Mountsoft
Moneybags	Arc	Jupiter Ace	£4 95	Mountsoft
Number Painter	Ed	MSX	£8 95	ASK
QL Lisp	Ut	QL	£59 95	Metacomco
Knight Lore	Arc	Spectrum	£9 95	Ultimate
Battlecars	S	Spectrum	£7 95	Games Workshop
D Day	S	Spectrum	£7 95	Games Workshop
Run for Gold	S	Spectrum	£9 95	Hill McGibbon
Yacht Race	S	Spectrum	£6 95	Hill McGibbon
Backpackers Guide to the Universe	Arc	Spectrum	£7 95	Fantasy

New Releases

PSI — LOW

It would be a shame if *Psi Warrior* — the new offering from Beyond — was completely overshadowed by the imminent release of *Doomdarks' Revenge*, even though they are for different machines.

You are the very nicely animated Psi Warrior, gliding along the various colourful areas of the Home Silo, with a mission to do battle with and destroy The Source, who is seriously considering the reduction of the Human Race to mindless hulks. (Someone should have told him *Coronation Street* has done it already twice a week for the last 20-odd years.)

Descending though the Silo you must trap PSI and Id creatures before they get you and increase your own mental powers at their expense. Then you can teleport, levitate, become invisible and remote-view your way to victory.

Looks like it could be worth a try — plus there's the now obligatory competition.

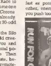
Program *Psi Warrior*
Price *£9.95 (cassette)*
£11.95 (disc)
Micro *CBM 64*
Supplier *Beyond*
Lector Court
153 Farringdon Road,
London EC1

RUNNING IN

Run For Gold by Hill MacGibbon really is an excellent program, featuring some truely excellent graphics. It's way beyond the usual left right pummeling featured in *Hyper Olympics* and the rest. Here the real flavour of training and moving up through the ranks is apparent — running as tactics rather than keyboard bashing.

A large nicely animated sprite seen from behind is your runner, other runners are computer controlled. You need to control speed and movement, and left and right. All my early attempts resulted in me crashing across the tracks and smashing into another runner.

It isn't a matter of running as fast as possible all the time either, energy is finite and if you push too hard at the beginning you'll have nothing left for the finish. And there are results boards, world record attempts, even occasional news flashes to spur you onto greater heights of competitive frenzy.



Program *Run for Gold*
Price *£9.95*
Micro *Spectrum*
Supplier *Hill MacGibbon*
92 Fleet Street
London EC4Y 1DH

Pick of the week

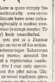
Knight Lore is quite simply the most technically awesome game Ultimate have ever released, graphically it makes everything else (except maybe *Tir Na Nog*) look neandathal.

What you get is a *Zaxxon* like, edge on view of the action as a cartoonesque Sabreman character moves around the rooms of a mysterious castle. Beyond this I can only speculate about the plot since Ultimate in its usual tradition gives nothing away on the box whatsoever. All I know is that your objective is to stop yourself from turning into a werewolf by finding a potion.

The graphics are masterpieces of design — Ultimate must be employing as many graphic designers as programmers these days. There are no colour resolution problems by the simple expediency (like *Tir Na Nog*) of making everything two-colour — I think it actually adds to the atmosphere.

Some rooms contain baddies of one sort or another to be avoided and most contain some sort of puzzle about how to get to the exit — a bit like *Manic Miner* in 3-D but with a greater freedom about how they are solved, eg, in one room it's a matter of getting some tables from a previous room and using them to jump high over an obstacle. In other rooms innocent looking platforms dissolve to reveal traps beneath — elsewhere secret alcoves containing treasures may be discovered.

CARTOONESQUE



Ultimate have termed this a 'do whatever you want with whatever you can find' option, filmation and it would seem to allow for much greater freedom of action, making the game that much more enjoyable.

I would stick my neck out and say that this must be one of the five best Spectrum games ever if it wasn't for the fact that some Ultimate games, whilst initially amazing have proved almost unplayable — *Lunar Jetman* being a case in point. I suspect that *Knight Lore* is going to prove very addictive indeed, though.

Program *Knight Lore*
Price *£9.95*
Micro *Spectrum*
Supplier *Ashby Computers and Graphics*
The Green
Ashby de la Zouch
Leicestershire LE6 5JU

This Week

Program	*Type*	*Micro*	*Price*	*Supplier*
Forest at World End	Ad	Amstrad	£6.00	Interceptor
Er*Bert	Arc	Amstrad	£5.95	Microbyte
Number Painter	Ed	Amstrad	£8.95	ASK
Airlift	Arc	BBC	£7.95	Superior Soft
Jack and Beanstalk	Arc	BBC	£7.95	Superior Soft
Overdrive	Arc	BBC	£7.95	Superior Soft
Smash and Grab	Arc	BBC	£7.95	Superior Soft
Space Pilot	Arc	BBC	£7.95	Superior Soft
Star Warp	Arc	BBC	£7.95	Superior Soft
Zany Kong Junior	Arc	BBC	£7.95	Superior Soft
Mr Wiz	Arc	Commodore 64	£7.95	Superior Soft
Raid over Moscow	Arc	Commodore 64	£9.95	US Gold
Smuggler	Arc	Commodore 64	£7.95	Superior Soft
U K Geography	Arc	Commodore 64	£7.95	Superior Soft
Astronomy	Ed	Commodore 64	£6.95	Scisoft
French	Ed	Commodore 64	£6.95	Scisoft
Geography	Ed	Commodore 64	£6.95	Scisoft

HE SLIMED ME!

Who you gonna call? *Ghostbusters!* you may not have seen the film yet, perhaps you ignored the hit record but you shouldn't miss the program of the film of the record. *Ghostbusters* is not only a pretty good game, it has what must be the best music ever heard on a computer game. Using the Commodore Sid chip and a mere three channels Activision have produced music that captures the record well enough to have the entire office and indeed all of Sunshine Towers bopping around the room.

Not only do you get music, but using some very nifty digital techniques you also get speech. As the music plays, press the spacebar and you get a very clear and slightly hysterical shout of GHOSTBUSTERS!

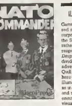
The game is more than an arcade shoot-em up, more like a strategy game mixed with a shoot-em-up. The idea is to make money by trapping ghosts making haunted houses suitable for ordinary American families. The first thing is to buy and equip your wagon — you need blasters and traps, and as you earn more money so you'll be able to buy bigger and better equipment.

Next stage is a map of the city which shows where ghosts are to be found. After driving along the road, you come to the house itself where the ghost must be trapped and blasted. The graphics are all consistently excellent and the game retains the interest — but the music!

Program	*Ghostbusters*
Price	*£9.95*
Micro	*Commodore 64*
Supplier	*Activision* *15 Harley House* *Marylebone Road* *Regent Park* *London NW1 5HE*

GHOSTBUSTERS

FAMILY FUN?



Now here's the simulation to end all simulations for paranoics everywhere. In *Nato Commander* you get to defend the free world from unprovoked Communist agression. Experience tension on your East German borders! Fun for all the family!

Unlike many strategy games this one keeps the commands down to a minimum: mostly it's a matter of using cursors and a couple of keys to move units around, get status reports, etc. The large scale map of units includes relevant details such as terrain, rivers, etc, movement works logically — ie it takes longer over rocky hills than smooth flats.

If things go really badly you get to use nuclear weapons though this costs you a penalty of one political point. That's all!? The game is extremely sophisticated, factors like political opinion and morale are important considerations. There is also a choice of scenarios one of which has Nato attacking first — surely we British would never do such a thing?

You may be one of those people who finds that the whole idea of European conflict is so frightening and disgusting it is not a proper subject for a computer game. If not it is at least cleverly programmed.

Program	*Nato Commander*
Price	*£9.95*
Micro	*Commodore 64*
Supplier	*US Gold* *Unit 10* *The Parkway* *Industrial Centre* *Heneage Street* *Birmingham B7 4LY*

ILLUMINATION

Games Workshop has released its first programs and, not surprisingly, all are loosely in the Strategy/Adventure mould rather than blam blams arcade response games. *Tower of Despair* is an epic adventure divided into two 48K Quilled adventures. Sometimes the Quill can be used lazily but here thoughtful touches such as illuminated letters (illuminated as in monks rather than lights) and redesigned character sets ensure there is no sense of visual déja vu.

Rather like the Salamander *Dan Diamond* series, the program comes with an illustrated booklet that also contains clues to the game as well as a couple of maps. The adventure itself looks pretty difficult.

Tower of Despair

Program	*Tower of Despair*
Price	*£7.95*
Micro	*Spectrum*
Supplier	*Games Workshop* *27/29 Sunbeam Road* *London NW10 6JP*

This Week

ASK, Applied Systems Knowledge London House 68 Upper Richmond Road London SW15 2RP, 01 874 6046 **Beau-Jolly,** Beau-Jolly 19A New Broadway Ealing London W5 5AW, 01 567 9710 **Fantasy,** Fantasy Software 27A St Georges Road, Cheltenham Glos GL50 3DT 0242 512231 **Games Workshop,** Games Workshop 27 29 Sunbeam Road London NW10 6JP 01 965 3713 **Hill McGibbon,** Hill McGibbon 92 Fleet Street, London EC4Y 1DH 01 353 6482 **Interceptor,** Interceptor Micro's Lindon House The Green Tadley Hampshire 07356 71145 **Metacomco,** Metacomco 26 Portland Square, Bristol BS2 8RZ 0272 428781 **Microbyte,** Microbyte Software, 18 Hilgrove Road, Newquay Cornwall TR7 2QZ 06373 6886 **Mountsoft,** Mountsoft Computing 91 Killingworth Dr, High Barnes Sunderland SR4 8QS **Scisoft,** Scisoft 5 Minister Gardens, Newthorpe Eastwood Nottingham NG16 2AT, 0773 764501 **Superior Soft,** Superior Software Regent House, Skinner Lane Leeds LS7 1AX 0532 459453 **US Gold,** US Gold Unit 10 The Parkway Ind Centre Heneage Street, Birmingham B7 4LY, 021 359 3020 **Ultimate,** Ultimate Play the Game Ashby de la Zouch Leicester LE6 5JV 0530 411485

Key **Ad** — adventure/**Arc** — arcade/**Ed** — education/
St — strategy/simulation/**Ut** — utility

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to This Week *Popular Computing Weekly* 12 13 Little Newport Street, London WC2H 3LD

Inverted snobbery

Most speakers produce nongrammatical utterances (with varying frequency), but even so they are understood by other people. This is not so with computer languages, because if an utterance (say a line of program) is ungrammatical, the meaning of that line will not be understood by the computer. Another term for grammar, more commonly used with computer languages, is 'syntax'.

There is a crucial distinction between 'meaning' and 'grammar' in the case of computer languages which is not as important for ordinary languages. For ordinary spoken languages, the difference between syntax and semantics can be the key element in much humour. A pun, play on words, or a 'knock, knock' joke depend upon the human ability to extract more than one meaning out of the same utterance.

The study of the meaning of a utterance in ordinary speech, or the meaning of a line of computer program, is termed semantics, and the study of any language is the study of both its syntax, and its semantics. Ordinary spoken languages are often known as 'natural languages', and with natural languages the rules are often not explicit, as they have to be with computer languages. Natural languages are not planned, they evolve.

I consider that one important reason why so many computer programs are badly written is that the programmer often uses the same approach to writing programs as he does in speaking his native language. Natural language is noted for its ability to fudge, and its lack of precision, which is acceptable in a spoken language, but is poor technique when programming a computer.

The incoherence of many programs, is related —, so I believe — to a general malaise in education. The malaise is the fear of precision, the desire to take the easy route — the 'never mind the spelling feel the emotion' syndrome. As the study of grammar becomes less and less important in teaching English today, tyro programmers are often unaware of the importance of syntax in their own spoken language, let alone in a programming language.

Anthony Burgess notes (in *Language made plain*) that it does not matter if gauge is spelt 'guage', because we all know what is meant. But do we? Burgess' position presupposes an erudition on the part of the reader, which is not shared by the person who cannot spell. Sympathy for the illiterate is inverted snobbery from those who are not illiterate — and is unfair to those who are.

Computers, however, are not fooled. One underestimated benefit which comes from the use of computers is the realization that words are important, and that sometimes rules have a purpose.

Boris Allan

Electric shock

Puzzle No 134

David was looking decidedly pale and shaken in the office this morning.

"Just had the electric bill," he replied in answer to my questioning. "They reckon it comes to several thousand pounds!"

"There must be either a fault in the system or a mistake has been made somewhere." I tried to reassure him.

"It's odd," continued David, "but I took the reading immediately after the meter reader had left and yet their reading comes to 78 217 units more than mine."

He showed me the two readings and as I studied them some spark of understanding stirred. "Where is your meter?" I asked.

"Oh," he replied "under the stairs — right at the back of a load of old junk. In fact, the man from the electric company had to lie full length on an old table with his head dangling over the end, to read the wretched thing."

"Ah," I exclaimed with a flourish worthy of Sherlock Holmes. "You see what he did was to read the five-digits *upside down*. For example 89801 would read as 10868."

Can you work out what the reading on the five figure meter was?

Solution to Puzzle No 129

A — 56 *B* — 83

From the clues, we knew that both *A* and *B* are in the range 32 to 99 as they have four-digit squares (Clues 1 down and 4 down). Also, *B* is the larger and exceeds *A* by at least 10 (Clue 5 down). By assigning values to *A* and *B* in the program, we can check if the relevant digits match in the grid.

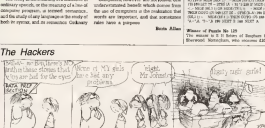
When comparing the position of digits within a string, the program assumes that the first character of the string is reserved for the positive/negative sign.

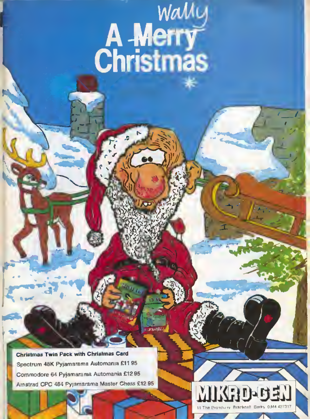
```
10 FOR A = 32 TO 62 20 FOR B = 48 TO 99 30 LET A$ =
STR$(A) 40 LET P$ = STR$(B * B) 50 IF MID$ (A$,3,1)
< > MID$(P$,2,1) THEN GOTO 170 60 LET Q$ = STR$ (A
+ B) 70 IF MID$ (Q$,4,1) < > MID$ (P$,5,1) THEN GOTO
170 80 LET R$ = STR$ (A * B) 90 IF MID$(R$,5,1) < >
MID$ (P$,4,1) THEN GOTO 170 100 LET S$ = STR$ (A *
A) 110 IF MID$ (S$,4,1) < > MID$ (R$,2,1) THEN GOTO
170 120 LET T$ = STR$ (A + B) * 3 130 IF MID$ (T$,4,1)
< > MID$ (R$,3,1) OR MID$ (T$,5,1) < > MID$ (Q$,2,1)
THEN GOTO 170 140 LET U$ = STR$ (B-A) 150 IF MID$
(U$,3,1) < > MID$ (R$,4,1) THEN GOTO 170 160 PRINT
"A =";A; "B =";B 170 NEXT B 180 NEXT A
```

Winner of Puzzle No 129

The winner is S H Briers of Bingham Road, Sherwood, Nottingham, who receives £10

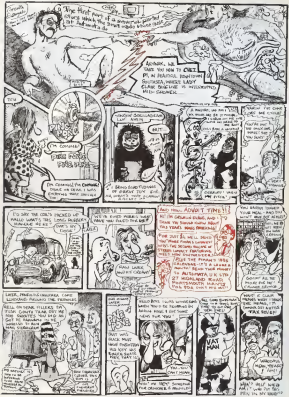
The Hackers


Believe me Ben, there's NO truth in these stories that vdus are bad for the eyes
DATA PREP SECTION
None of MY girls have had any problems
'night Mr Johnston!
'Nighty night girls!



Christmas Twin Pack with Christmas Card
Spectrum 48K Pyjamarama Automania £11 95
Commodore 64 Pyjamarama Automania £12 95
Amstrad CPC 464 Pyjamarama Master Chess £12 95

MIKRO-GEN
11 The Broadway Bracknell Berks 0344 427317


Greala Evangelo
The first part of a several parted story which the Devil made these guys at Automata do
ANYWAY, WE TAKE YOU NOW TO CHEZ PI, IN BEAUTIFUL DOWNTOWN SOUTHSEA, WHERE LADY CLAIR SINCLIVE IS INTERRUPTED MID-SHOWER
©AUTOMATA UK LTD 1984
TCH
PING PONG
I'M COMING!
PING PONG
PING PONG
I'M COMING! I'M COMING! DEAR OH DEAR I WAS ENJOYING THAT SHOWER TOO!
SINGIN' GORILLAGRAM LUV AHEM
BUT...
I BRING GLAD TIDINGS OF GREAT JOY FOR OH, WHAT'S THAT FLAMIN' RACKET ??
A MINSTREL LAD AM I MY PANTS ARE BY ST MICHAEL I STRUM ON ME UKE WITH NO WEAR TO ME BOOT COS I RIDE A UNICYCLE
GERROFF! THIS IS MY PITCH!
YAROO! I'VE COME ORF ME CYCLE!
YOU'RE NOT THE ONLY ONE, MATE! SEE YOU GUYS!
VERY STRANGE
I'D SAY THE COIL'S PACKED UP HALLO WHAT'S THIS LONG RUBBERY HANDLE HERE?
DAT'S BY DOSE!
LATER
WE'VE FIXED MORRIS WHAT HAVE YOU FIXED FOR US?
RAW LIVER AND ICE CREAM!
AND NOW... ADVOIT TIME!!
HI! I'M GREMLIN EVANS, AND I THINK YOU SHOULD KNOW ABOUT THIS YEARS XMAS STOCKING!
FOR JUST £4 WE'LL SEND YOU "MORE PIMAN'S GREATEST HITS" - THE SECOND VOLUME OF STEREO LUNACY FEATURING MEL'S NEW SYNTHESIZER!
PLUS THE PIMAN'S 1985 CALENDAR - IT'S A LAUGH A MONTH! SEND YOUR MONEY TO AUTOMATA U K LTD 27 HIGHLAND ROAD, PORTSMOUTH HANTS PO4 9DA DON'T MISS OUT!!
YOU HARDLY TOUCHED YOUR MEAL - AND YOU WON'T HAVE ANY AFTERS?
NO - WE'RE NOT KEEN ON WAX CRAYONS
GOODY! ALL THE MORE FOR ME! CRUNCH CRUNCH
LATER, PENFOLD & CROUCHER COME LURKING AROUND THE PREMISES
HELL OH DEAR FILLERS I'M JUSH GONTU TRAH OUT ME NOO SKATES YOU DIG AH GOT DE DAHNAMO IN DE WHEELSH TO RUN MAH STEREOGRAM!
HOW FIENDISHLY CLEVER THIS BOY IS
OR CLEVERLY FIENDISH
ONE MINUTE LATER
PING PONG
THAT WAS QUICK MUST HAVE FORGOTTEN HIS KEY HIS ROLLER-SKATE KEY, THAT IS!
HELLO BOYS I WAS WONDERING WHEN YOU'D BE DROPPING BY AGAIN HAVE I GOT SOME NEWS FOR YOU!
YOU... YOU CAN'T MEAN
WHO? OH HEY! SOMEONE FOR CROUCHER & PENFOLD!
ALL GOOD ENDS MUST COME TO A THING, BOYS! TIME TO GO DIG YER DUES!
VAT MAN
WAIT! IF CLAIR MEANS WHAT I THINK SHE MEANS, I'M GONNA GET A LITTLE TAX RELIEF!
WHADDAYA MEAN, YOU ARE? AM!!
WHA'? HELP WHERE AM I? WHO PUT THIS PEN IN MY HAND!!